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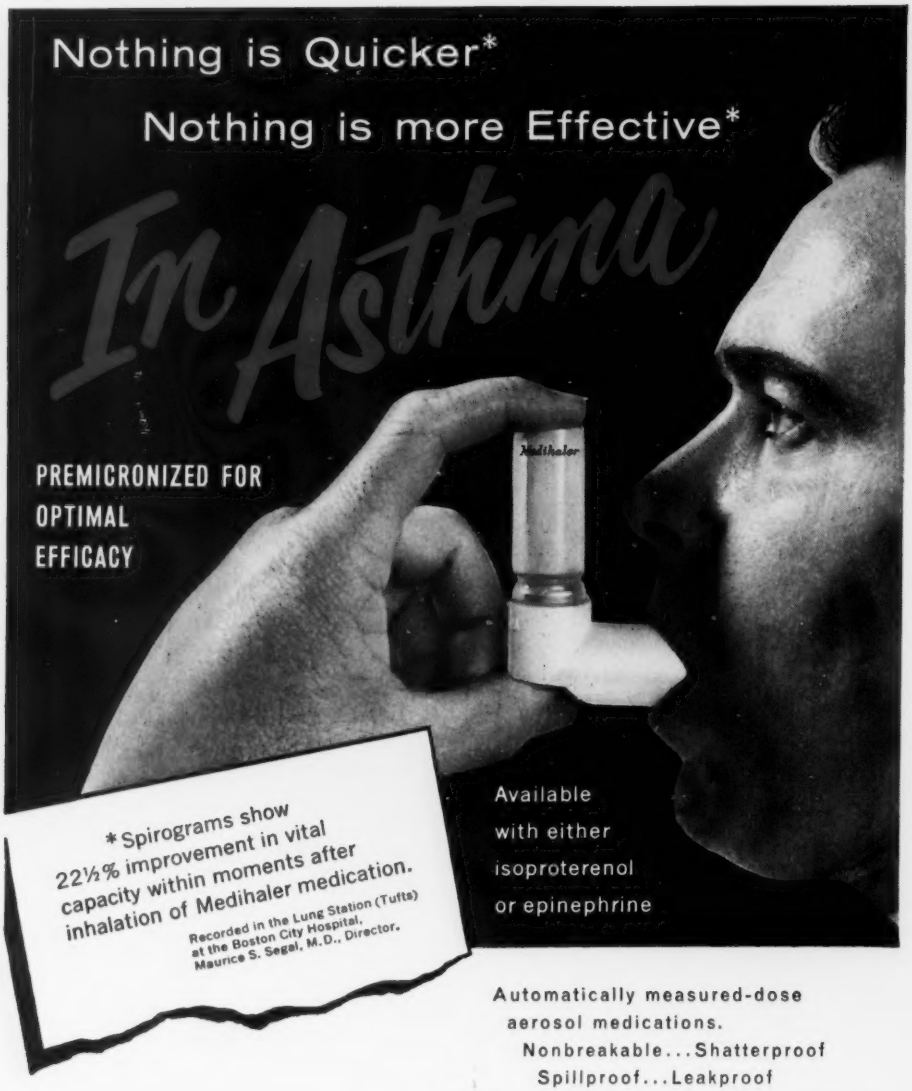
MAY 1959

Volume 28 Number 5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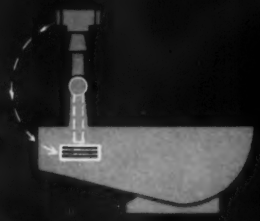

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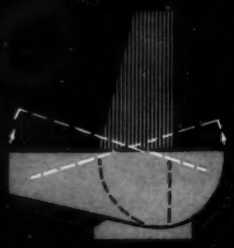

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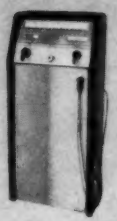

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ESTABLISHED 1932

The International Journal of Medicine in Industry

MAY, 1959
VOLUME XXVIII
NUMBER 5

CONTENTS

Allergy in the Rubber Industry 209
Rex H. Wilson, M.D., E. H. Planck, M.D. and W. E. McCormick

Relation of Interrupted Pulsed Microwaves to Biological Hazards 212
William B. Deichmann, Ph.D., F.R.S., M. Keplinger, Ph.D. and E. Bernal, D.V.M.

Radiation Hazards Resulting from Clinical Use of Radioactive Isotopes 214
Harold E. Davis, M.D. and Raymond E. Parks, M.D.

A Surface Analgesic in Treatment of Musculoskeletal Affections 217
Edward E. Gordon, M.D. and Albert Haas, M.D.

Moscow Medicine 221
Robert M. Hosler, M.D., F.A.C.S.

Ceremony for Professors Emeriti, Harvard School of Public Health 224

The Periodic Health Examination in Preventive Medicine .. 226
E. L. Crumpacker, M.D. and James P. Baker, M.D.

Psychological Aspects of Accident Causation 230
John MacIver, M.D., M.P.H.

Formaldehyde in Wrinkle-proof Apparel Produces . . . Tears for Milady 232
H. G. Bourne, Jr. and S. Seferian

Effect of Footgear upon the Energy Cost of Walking .. 234
Peter V. Karpovich, M.D., C. E. Keeny, Ph.D. and A. A. Alexander, M.S.

The Nurse's Role in Health Maintenance and Accident Prevention 238
Richard A. Sutter, M.D.

Role of Government and the Community in Preventive Medical Services 246
Admiral Ben Moreell

Edward C. Holmblad, M.D. — Mr. Industrial Medicine .. 250

Letters, Books 252

Editorial: The White Coat Curtain 255

Personal News & Notes 4, 6, 8, 10

Comment and Opinion 35

Index of Advertisers 38

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PERSONAL NEWS AND NOTES

JOSEPH B. TAUBER, M.D., has been appointed Works Physician at the Aliquippa (Pennsylvania) Works of Jones & Laughlin Steel Corporation. He succeeds the late J. A. VOGEL, M.D.

A native of Czechoslovakia, where he received most of his early education as well as his medical training, DR. TAUBER has been Assistant Works Physician at J & L's Aliquippa Works since January, 1955. Prior to that, he was a research fellow in industrial medicine at the University of Pittsburgh Graduate School of Public Health.

During World War II, he served as medical officer in the Royal Netherlands Navy. His postwar experience includes a position as medical officer for the United Nations Relief & Rehabilitation Administration, Geneva, Switzerland.

Prior to World War II, DR. TAUBER served with the Czechoslovakian Ministry of Health. He received his medical doctorate from the University of Prague Medical School. A part of his undergraduate medical studies were at the University of Paris and the University of Munich. He has done graduate work at the Tropical School of Medicine, Liverpool, England; Malaria Research Institute, Portuguese East Africa, and at the University of London.

His published papers include resarch on Malta fever and on "Netherlands Children in England." He also has written papers on "The Prevalence of Diseases of the Heart in an Urban Center" and "The Magnitude of the Heart Disease Problem," and is the coauthor of a paper, "Household Survey, Individual Interview, and Clinical Examination to Determine Prevalence of Heart Disease."

MAJOR GENERAL WILFORD F. HALL, who pioneered in the development of an air evacuation system for military patients, has been appointed to the staff of the University of Cincinnati College of Medicine.

ROBERT A. KEHOE, M.D., Director of UC's Institute of Industrial Health, said the Air Force officer will become a part-time associate clinical professor of industrial medicine.

He will supervise the field training of Air Force personnel, who are third-year graduate students in the Institute's occupational medicine and hygiene program.

GENERAL HALL is Command Surgeon of the Headquarters Air Materiel Command at Wright-Patterson field.

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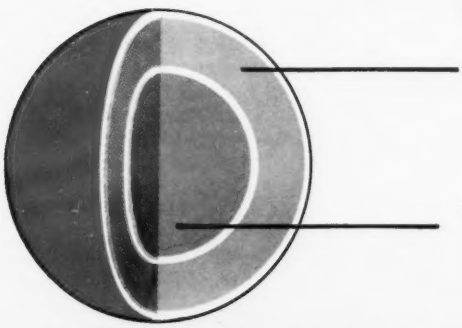

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His concept of evacuating wounded was first put to a test during the Korean war and the technique has since become standard.

He is a founder of the American Board of Aviation Medicine and is chairman of the preventive medicine section of the American Medical Association. —From *Cincinnati* (Ohio) *Post*, Feb. 26, 1959.

Medical facilities at Lorain Works of U. S. Steel's National Tube Division have earned the Certificate of Approval of the nation's top medical and health service group, the Occupational Health Institute.

The award was made this week by PAUL A. DAVIS, M.D., consultant for the Occupational Health Institute in this area of northern Ohio.

"We can't help but be proud of this distinction. Industrial medical units which earn the Certificate of Approval must show that they have established programs which offer the best in occupational health services and medical facilities," said T. H. KENNEDY, general superintendent.

As WILLIAM J. RALSTON, M.D., head of the medical staff at Lorain Works, explains it, "The Institute requires that you do more than just treat cuts and bruises. It has established rigid standards for a well-rounded medical program. This program must include staff and facilities for the treatment of occupational injuries and diseases; preplacement physical examinations; periodic occupational examinations; a general health survey program, and health counseling services."

Lorain Works' medical staff now includes four doctors, one of whom is a full-time staff physician; 10 nurses; a laboratory technician; a physiotherapist and a consulting staff of physicians in each medical speciality.

"One of the important features of our present program is in the area of preventive medicine," says DR. RALSTON. "Through our health survey program and health counseling service, we are able to direct employees to their own personal physicians for proper care at the proper time. This, we believe, avoids many serious problems in medical care for both the individual employee and his own family doctor."

DR. DAVIS explains the functions of the Occupational Health Institute as providing a means for the exchange of information among comparable medical units; affording unbiased professional evaluation of medical services and facilities; establishing high standards for the field of occupational health services.

Left to Right: Paul A. Davis, M.D., W. J. Ralston, M.D. and C. V. Province, Manager of Industrial Relations.

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STUART B. OVER, M.D., has joined the staff of the clinical division of Sandia Corporation's medical organization.

An internal medicine specialist, DR. OVER'S career for the past 10 years has been in industrial medicine. He served several industrial firms in Tucson, Arizona, in addition to his private practice, for five years prior to joining Sandia.

From 1948 through 1954 he was a staff physician with the American Cyanamid Co. in Pittsburgh, Pa. During 1946-48 he was in private practice in Williamsport, Pa.

Prior to this he was an assistant to an internal medicine specialist in Chicago and spent the preceding year as an industrial physician with the Alabama Ordnance Works in Childersburg, Ala.

DR. OVER was graduated in 1941 from Jefferson Medical College in Philadelphia, Pa., and interned at the Williamsport General Hospital.

—From *Albuquerque* (New Mexico) *Tribune*, Feb. 27, 1959.

MELVIN M. UDEL, M.D., has been appointed Director of the Safety and Occupational Health Bureau of the Metropolitan Life Insurance Company, New York City. DR. UDEL comes from the Department of Occupational Medicine, Columbia University School of Public Health and Administrative Medicine, where his work included research, teaching and private consultation on medical problems in industry.

DR. UDEL received his M.D. degree from the University of Maryland. In addition to general medical and psychiatric residencies, his educational background includes graduate work at Cornell University in industrial psychiatry. He has had broad training and experience in occupational health and safety, having served with the United States Public Health Service and with the Division of Industrial Hygiene of the New York State Labor Department.

DR. UDEL will be responsible for the Metropolitan Life Insurance program of accident prevention, including traffic and home, as well as occupational health and safety.

GORDON W. PETERSEN, M.D., who has served since 1953 as Medical Director of Kimberly-Clark Corp., Neenah, Wisconsin, has been elected a Fellow of the Industrial Medical Association in "recognition for outstanding work in the field of industrial medicine."

Announcement of the election was made by H. W. LAWRENCE, M.D., Cincinnati, Ohio, president of the association, who said that the Fellowship certificate would be awarded during the annual meeting of the association in Chicago April 29.

DR. PETERSEN is a member of the Committee on Industrial Health of the Wisconsin State Medical Society and is chairman of the subcommittee on Small Plant Industrial Health programs. He is on the board of governors for the Central States Society of Industrial Medicine and Surgery and is a member of the American Academy of Occupational Medicine.

—From *Neenah* (Wisconsin) *News Record*, March 11, 1959.

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REFERENCES: • 1. Freyberg, R. H.; Berntsen, C. A., Jr., and Hellman, L.: Arth. & Rheum. 1:215 (June) 1958. • 2. Sherwood, H., and Cooke, R. A.: J. Allergy 28:97 (March) 1957. • 3. Shelley, W. B.; Harun, J. S., and Pillsbury, D. M.: J.A.M.A. 167:959 (June 21) 1958. • 4. Dubois, E.L.: California Med. 89:195 (Sept.) 1958. • 5. Hartung, E.F.: J.A.M.A. 167:973 (June 21) 1958.

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Argentine Society of Sports and Occupational Medicine, to commemorate its 25th Anniversary, is organizing the Second Argentine Congress on Occupational Medicine and the Symposium on Integral Scientific Study of Labor to be held in Buenos Aires, June 15 to 30, 1959.

The subjects considered at the Congress will deal with industrial medicine in Argentina's major industries.

The following subjects will be considered: Rural Work, Building Industry, Textile Industry, Mining Industry.

The reports are to be debated in plenary sessions and will be prepared by "Committees of Study" formed by specialized professionals in occupational medicine, engineering, architecture, industrial chemistry, occupational legislation, psychology, scientific organization of labor, security, hygiene, social assistance, rehabilitation and others.

For further information write: Secretary of the Congress, Arenales Street 981, Buenos Aires, Argentina.

EDWARD G. WHIPPLE, M.D., has been retired as an Expert Consultant in Dust Disease to the New York State Workmen's Compensation Board. He was retired at 77 years of age from the post he has held for more than 14 years.

Although the Civil Service Law requires State employees to be retired on their seventieth birthday, the Board had been successful in securing waivers to that requirement for the last seven years.

DR. WHIPPLE'S distinctive talents in a specialized area of medicine have been of enormous value and distinction. He was one of three Expert Consultants in Dust Disease.

ALBERT E. WOELTJEN, M.D., has been named Associate Medical Director of Pfizer Laboratories. In his new post, he will be concerned with medical aspects of product development and marketing. He will also serve as consulting editor to Pfizer *Spectrum*, a monthly magazine of medical information for physicians.

DR. WOELTJEN received his M.D. degree from the University of Illinois College of Medicine, and holds a Master of Public Health degree from the University of Michigan. His medical experience includes general practice, industrial medicine and public health service.

Before joining Pfizer, Dr. Woeltjen was director of the Lee County Health Department in Illinois. His long-time medical interests have been with infectious diseases and chronic conditions of the aged.

WILLIAM F. BETSCH, M.D., has been appointed Medical Director of Philadelphia Electric Company. He succeeds DR. J. C. MCCONAUGHEY, retired.

DR. BETSCH, a graduate of Colgate University and Harvard Medical School, has been associated with the Philadelphia Electric medical staff since 1948 and had served as assistant medical director since 1955. He was formerly associated with the Benjamin Franklin Clinic of Pennsylvania Hospital, Philadelphia, and was a flight surgeon with the Air Force during his military service.

He is a member of the Philadelphia County and Pennsylvania Medical societies, the American Medical and Philadelphia Industrial Medical Associations, the Burlington County (N. J.) Medical Society, and the medical staff of Pennsylvania Hospital. —From *Norristown* (Pennsylvania) *Times Herald*, March 5, 1959.

GORDON A. HOLDEN, M.D., Manager of Health Service at General Electric's Light Military Electronics Department, has been elected a Fellow of the Industrial Medical Association. The election is in "recognition for outstanding work in the field of industrial medicine."

HOLDEN will receive the fellowship certificate April 29 at the annual association meeting during an industrial health conference in Chicago.

HOLDEN is a member of the staffs of Faxton and Utica State Hospitals.

He is a Fellow of the American College of Surgeons, Diplomate of the American Board of Surgery and medical advisor of Draft Board 49. He is also a member of the American Medical Association, New York State Medical Society, Oneida County Medical Society, Utica Academy of Medicine and Central New York Surgical Society.

—From *Utica* (New York) *Press*, March 19, 1959.

100

a significant *Sanborn achievement in electrocardiographs*

VISO

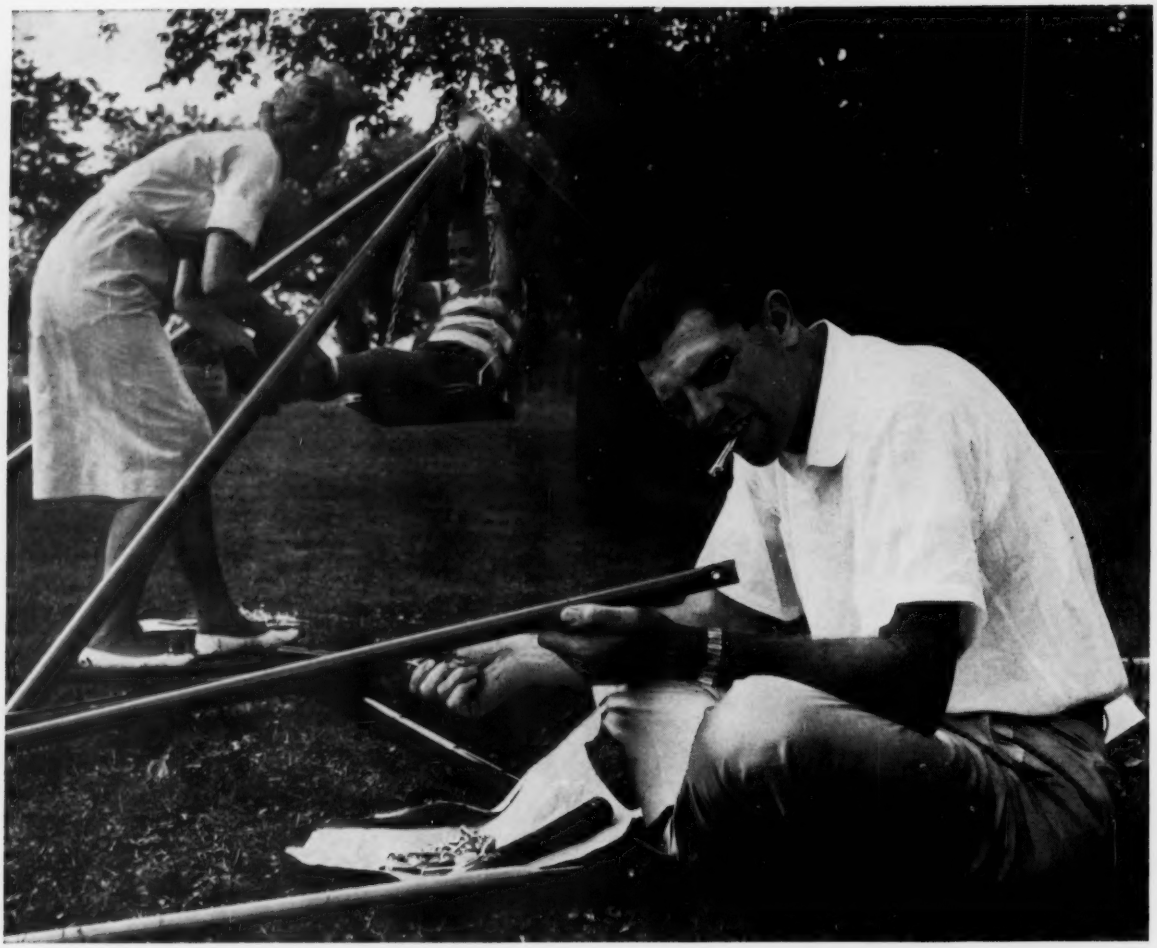
the completely new, 2-speed

SANBORN Model 100 VISO-CARDIETTE

Here is an electrocardiograph in which *no detail* has been overlooked to give you diagnostically *accurate* information . . . the greatest possible operating *convenience* . . . and modern, *functional* attractiveness. With thirty-five years of experience, this is the finest electrocardiograph Sanborn Company has ever produced. Priced at eight hundred fifty dollars, delivered continental U. S. A.

SANBORN COMPANY

MEDICAL DIVISION • 175 Wyman St., Waltham 54, Mass.



BUILDING

Food is the source of all body protein . . . the primary building material of all living cells . . . of enzymes which digest and metabolize food and synthesize new body tissue . . . of hormones which regulate growth and body functioning . . . of antibodies which protect from disease . . . even of the genes which determine the characteristics of the individual.

The efficiency with which food proteins are used depends upon the balance of essential amino acids which are simultaneously supplied with sufficient calories from fat and carbohydrate . . . and with needed minerals and vitamins. Not all food proteins, individually consumed, are equally well utilized for building body tissues . . . because food proteins vary in structure . . . in their amino acid content. However, food proteins are seldom eaten individually. Instead, proteins of different foods are combined in meals . . . and the amino acids in each tend to supplement each other . . . as do the other nutrients present.

In *A Guide to Good Eating*, the foods in the first two groups listed supply the highest quality protein . . . and, in amounts given, most of the Recommended Dietary Allowance for this nutrient . . .
milk, cheese and ice cream . . . 1/4 the protein; the meat group . . . more than 1/3 the protein.

Protein is contributed in lesser amounts by foods in the last two groups . . .
vegetables and fruits . . . about 1/14 the protein; breads and cereals . . . about 1/7 the protein.

When combined in well-prepared meals, foods selected from each of these four food groups can provide adequate protein, while satisfying the tastes, appetites and all other nutrient needs of all members of the family, young and old.

USE DAILY
A GUIDE TO GOOD EATING

DAIRY FOODS
3 to 4 glasses milk—children
4 or more glasses—teenagers
2 or more glasses—adults
Cheese, ice cream and other milk-made foods can supply part of the milk

MEAT GROUP
2 or more servings
Meats, fish, poultry, eggs, or cheeses—with dry beans, peas, nuts as alternates

VEGETABLES AND FRUITS
4 or more servings
Include dark green or yellow vegetables, citrus fruit or tomatoes

BREADS AND CEREALS
4 or more servings
Enriched or whole-grain
Added milk improves nutritional values

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

Since 1915 . . . promoting better health through nutrition research and education

NATIONAL DAIRY COUNCIL
A non-profit organization
111 NORTH CANAL STREET · CHICAGO 6, ILLINOIS

THIS ADVERTISEMENT IS ONE OF A SERIES. REPRINTS ARE AVAILABLE UPON REQUEST.

Why the
FLEET® ENEMA
Disposable Unit
has a two-inch
rectal tube[1]

A rectal tube, *inserted over two inches,* may cause tearing of the mucosa or perforation.[2] For safety and efficacy, insist on FLEET ENEMA Disposable Unit with the two-inch, anatomically correct, pre-lubricated rectal tube.[3] Each hand-size, squeeze bottle, contains per 100 cc, 16 Gm. sodium biphosphate and 6 Gm. sodium phosphate. Adult Size, 4½ fl. oz. . . . Pediatric Size, 2¼ fl. oz.

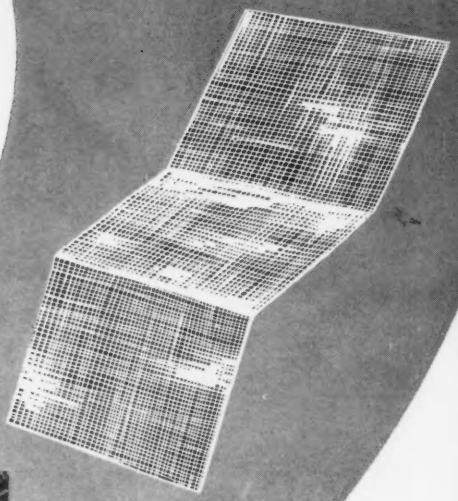
Also gentle, prompt, thorough . . . PHOSPHO-®SODA (Fleet), saline laxative of choice . . . 48 Gm. sodium biphosphate, 18 Gm. sodium phosphate per 100 cc.

FLEET® ENEMA
Disposable Unit

References: 1. Pratt, J. H. and Jackman, R. J., Proc. Staff Meeting, Mayo Clinic 20:277, 1945. 2. "Injuries to bowel as result of an enema", Frech, H. C. and Lanier, L. R., Jr., Am. Jl. Obst. & Gyn. 74:146, 1957. 3. Bookmiller, R. N. and Bowen, G. L., "Textbook of Obst. and Obst. Nursing", 3rd Ed., Saunders, 1958.

C. B. FLEET CO., INC., *Lynchburg, Virginia*

The NEW DUAL PURPOSE



VASELINE
PETROLATUM GAUZE U. S. P.
STERILE
3 x 3 PAD, opens to 3 x 9 INCHES
Fine Mesh Absorbent Gauze (44/36)
Impregnated with White Petrolatum
CHESEBROUGH-POND'S INC.
NEW YORK 17, N.Y.
UNOPENED ENVELOPE MAY BE AUTOCLAVED OR COLD-SOAKED
TEAR HERE

3″ x 9″ STRIP

Shorter length ends waste on small area wounds. New Z-fold insures perfect graft takes. Guaranteed sterile at time of use.

3″ x 3″ PAD

Three-ply, fine-mesh gauze, lightly impregnated — for use in physician's office, industrial medical department, first aid.

6th SIZE of VASELINE® PETROLATUM GAUZE

Now supplied in:	1/2″x 72″	3″x 18″
	1″x 36″	3″x 36″
	3″x 3″/ 3″x 9″	6″x 36″

Sole Maker:

CHESEBROUGH-POND'S INC.
Professional Products Division
New York 17, N. Y.

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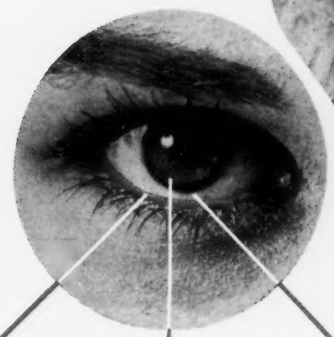

common "outer eye" disorders

allergic
(allergic blepharitis, allergic conjunctivitis, episcleritis)

inflammatory
(acute catarrhal conjunctivitis, ulceration, meibomitis, keratitis)

traumatic
(foreign bodies, burns, abrasions, lacerations)

consistently respond to topical therapy with

METIMYD®

ophthalmic suspension

prednisolone 0.5% plus sulfacetamide sodium 10%

ointment with neomycin 0.25%

Tissue destruction is halted, healing is set in motion by the anti-inflammatory, antiallergic action of prednisolone and the antimicrobial property of sulfacetamide sodium combined in METIMYD Suspension...and for an even wider spectrum of antibacterial effectiveness, neomycin sulfate is added in METIMYD Ointment, the ointment form assuring sustained therapeutic action through the night.

Schering

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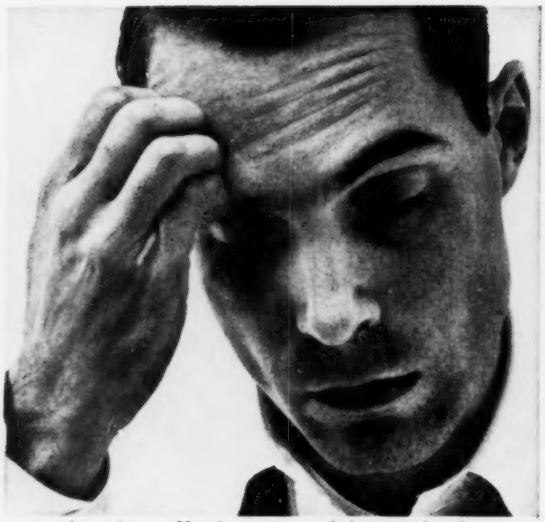
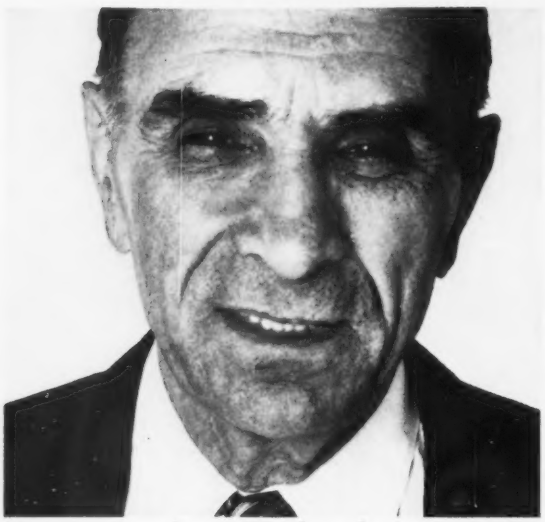
MT-J-239

even glasses hurt my nose



throbs all day, could explode



hurts to laugh

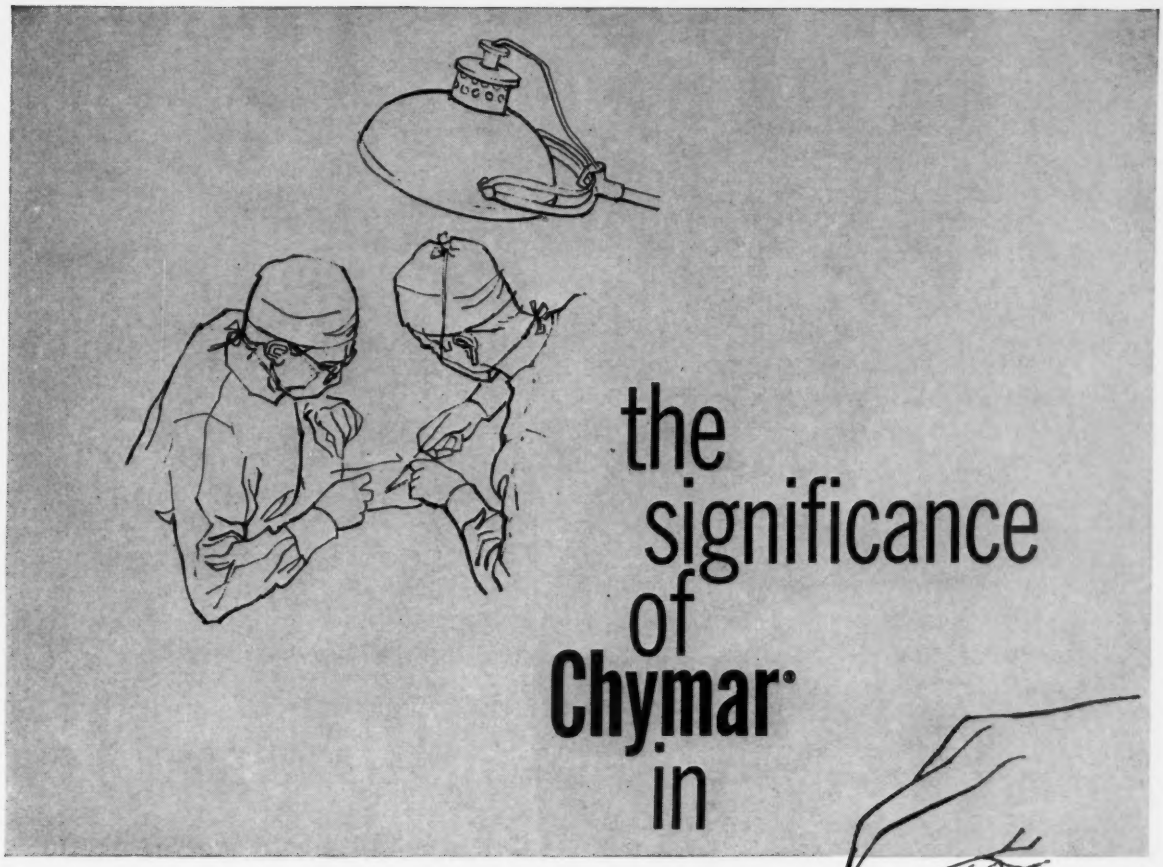
pressure inside is terrible

resolve sinus headache–**Sinutab***

With a single new prescription you can resolve sinus or frontal headache. Sinutab aborts pain, decongests, relieves pressure and provides mild tranquilizing action to relax the patient. Prescribe Sinutab for prompt dependable relief of sinus or frontal headache. AVERAGE DOSAGE: Adults: Two tablets every four hours; prophylactically, one tablet every four hours. Children 6 to 12 years: one-half adult dosage. SINUTAB IS: N-acetyl-para-aminophenol, (APAP) 150 mg. (2½ gr.); Acetophenetidin, 150 mg. (2½ gr.); Phenylpropanolamine HCl, 25 mg. (⅜ gr.); Phenyltoloxamine Dihydrogen Citrate, 22 mg. (⅓ gr.). SUPPLIED: Bottles of 30 tablets.

WARNER
CHILCOTT
MORRIS PLAINS, N. J.

*TRADEMARK



the significance of Chymar® in SURGERY

Chymar helps reduce inflammation and provides rapid absorption of edema and blood extravasates that often follow surgical procedures. Chymar also benefits the patient's general condition. Pain is often relieved within hours and the need for narcotics and analgesics markedly reduced. When given at an early stage, Chymar acts as a prophylactic in helping prevent inflammation and swelling.

Dosage: Inject 0.5 cc. before operating, then 1 cc. every 8-12 hours for 24 hours, followed by 0.5 cc. once or twice daily depending on the patient's progress.

Supplied: 5 ml. multiple dose vials. Each ml. contains 5,000 Armour Units. Available as Chymar Aqueous or Chymar in Oil.

CHYMAR *Aqueous* • *crystallized chymotrypsin in sodium chloride injection*

• the only one-vial aqueous solution of chymotrypsin in pure, crystallized state • no known incompatibilities • sensitivity to chymotrypsin is uncommon • vehicle devoid of allergenic properties

ARMOUR

ARMOUR PHARMACEUTICAL COMPANY — KANKAKEE, ILLINOIS / *a leader in biochemical research*

for
season-long
immunity
to
poison ivy
or
poison oak

keep them on the job with **AQUA IVY, AP®**

alum precipitated pyridine-ivy extract suspended in saline solution

Good to excellent results — up to 93% of cases.[1-6]

"... superior to either alcohol/ether or the oil resorption materials because of the ease of its administration, its concentrated dosage, and its more effective clinical results along with lessened possibility of exacerbations of symptoms. The alum precipitated material is slowly absorbed".[2]

Non-toxic — non-irritating
"... even when administered to children ...",[3]

HOW SUPPLIED In a combination package containing one 5 cc. vial of a 1:50 dilution (0.3 mg./cc.) and one 10 cc. vial of a 1:5 dilution (3.0 mg./cc.) (administration sufficient for at least 3 patients).

REFERENCES

1. Gaillard, G. E.: New York J. Med. 56:14, 1956.
2. Passenger, R. E., Spain, W. C. and Strauss, M. B.: J. Allergy 27: 409-423, 1956.
3. Fontana, V. J.: GP 10:47, 1954.
4. Gaillard, G. E.: J. Allergy 21:55, 1950.
5. Strauss, M. B. and Spain, W. C.: J. Allergy 17: 1-10, 1946.
6. Neidorff, H. A.: Personal Communication.

Also available as AQUA IVY, AP® TABLETS for oral prophylaxis in bottles of 100 tablets of 0.6 mg. each. Each tablet contains 0.6 mg. dry alum precipitated pyridine-ivy.

Literature on request – WRITE TO DEPT. **H1**

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10 East 40th Street, New York 16, N. Y.

rely on

Sinaxar® (STYRAMATE, ARMOUR)

a specific skeletal muscle relaxant

Chemically unlike any other muscle relaxant, Sinaxar is

- consistently effective in the majority of cases
- long acting: no fleeting effects
- purely a skeletal muscle relaxant . . . free of adverse physical or psychic effects frequently encountered with tranquilizers

DOSAGE: *Two tablets three or four times daily.*

SUPPLIED: *200 mg. tablets in bottles of 50.*

INDICATIONS: Any condition involving skeletal muscle spasm, as ***musculoskeletal disorders:*** acute and chronic back ache; arthritides; bursitis; disc syndrome; fibrositis; myalgia; myositis; osteoarthritis; following orthopedic procedures; rheumatoid arthritis; spondylitis; sprains and strains; torticollis; ***neurologic disorders:*** cerebral palsy; cerebrovascular accidents; cervical root syndrome; multiple sclerosis.

ARMOUR

ARMOUR PHARMACEUTICAL COMPANY • *A Leader in Biochemical Research* • KANKAKEE, ILLINOIS

Spray on rapid and profound relief of pain...

1st, 2nd and 3rd degree burns, cuts, lacerations and abrasions . . .

ONLY

AMERICAINE (Aerosol, Ointment and Liquid) contains 20% dissolved benzocaine—MOST POTENT*—LEAST TOXIC* of topical anesthetics.
*References on request

Americaine®
AEROSOL

"By stopping the pain, shock apparently is eliminated or minimized."[1] Every plant should have Americaine Aerosol for emergency use.

- **relieves pain in 2-3 minutes . . . lasts 4-6 hours**
- **easy to apply . . . covers large areas quickly**
- **water-soluble, bacteriostatic, sanitary**
- **excellent for pre-debridement of abrasions, etc.**
- **no sensitivity in over 12,600 published cases**

1. Kuba, E. F.: First Stage Treatment of Burns and Prevention of Shock, Indust. Med. 12:369-371 (Aug.) 1958.

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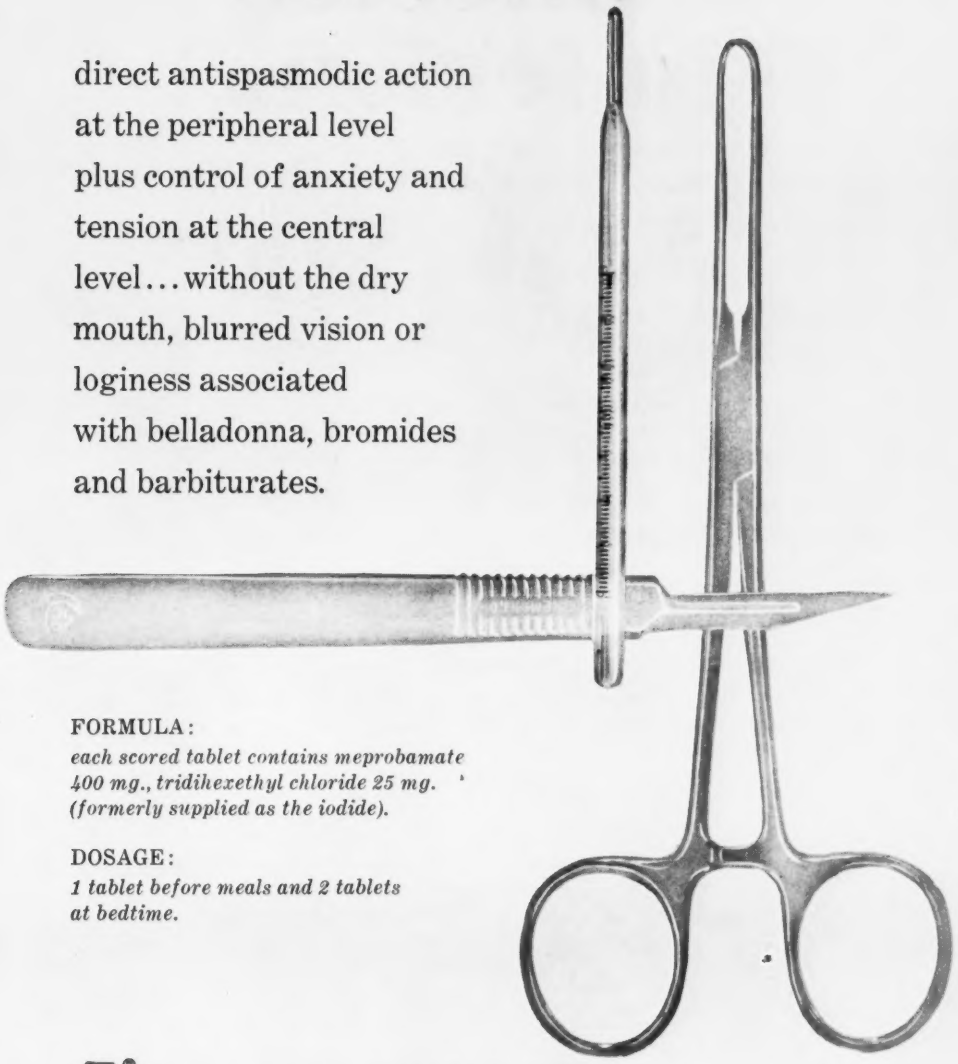
CONTROL G.I. SPASM
PRE and POST OPERATIVELY

Milpath®

®Miltown + *anticholinergic*

direct antispasmodic action
at the peripheral level
plus control of anxiety and
tension at the central
level... without the dry
mouth, blurred vision or
loginess associated
with belladonna, bromides
and barbiturates.



FORMULA:
each scored tablet contains meprobamate 400 mg., tridihexethyl chloride 25 mg. (formerly supplied as the iodide).

DOSAGE:
1 tablet before meals and 2 tablets at bedtime.

WALLACE LABORATORIES *New Brunswick, N. J.*

new for total management of itching,[1,2] inflamed,[3,4] infected[5,6] skin lesions

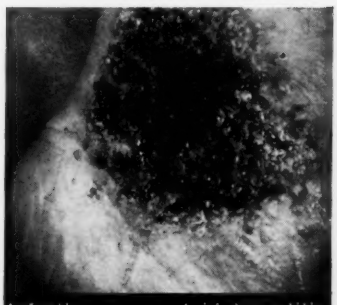
Dermatitis repens
7 weeks duration

Cleared in 5 days

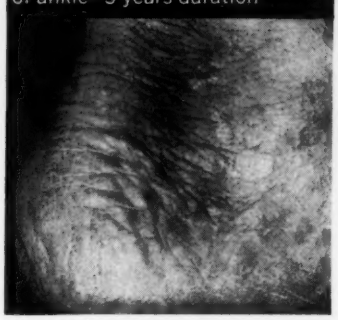
Mycolog ointment

Kenalog, Spectrocin and Mycostatin in Plastibase

antipruritic/anti-inflammatory/antibacterial/antifungal



Infectious eczematoid dermatitis of ankle—5 years duration



Cleared in 20 days

Mycolog Ointment – containing the new superior topical corticoid Kenalog – reduces inflammation,[3,4] relieves itching,[1,2] and combats or prevents bacterial, monilial and mixed infections.[5-7] It is extremely well tolerated, and assures a rapid, decisive clinical response for most infected dermatoses.

> "Thirty-one of 38 patients . . . obtained excellent or good control of dermatological lesions . . . [Mycolog] was highly effective, particularly in the management of mixed infections. Several recalcitrant eruptions which had not responded to previous therapy were remarkably responsive to the daily application of this preparation over periods of 2 to 3 weeks."[5]

For total management of itching, inflamed, infected skin lesions, Mycolog contains triamcinolone acetonide, an outstanding new topical corticoid for prompt, effective relief of itching, burning and inflammation[1-4] – neomycin and gramicidin for powerful antibacterial action[7] – and nystatin for treating or preventing Candida (Monilia) albicans infections.[8,9]

Application: Apply 2 to 3 times daily. Supply: 5 Gm. and 15 Gm. tubes. Each gram supplies 1.0 mg. (0.1%) triamcinolone acetonide, 2.5 mg. neomycin base, 0.25 mg. gramicidin, and 100,000 units nystatin in PLASTIBASE.

References: 1. Sheimire, J.B., Jr.: Monographs on Therapy 3:164 (Nov.) 1958. • 2. Nix, T.E., Jr., and Derbes, V.J.: Monographs on Therapy 3:123 (Nov.) 1958. • 3. Robinson, R.C.V.: Bull. School of Med., U. Maryland 43:54 (July) 1958. • 4. Sternberg, T.H.; Newcomer, V.D., and Reisner, R.M.: Monographs on Therapy 3:115 (Nov.) 1958. • 5. Clark, R.F., and Hallett, J.J.: Monographs on Therapy, 3:153 (Nov.) 1958. • 6. Smith J.G., Jr.; Zawisza, R.J., and Blank, H.: Monographs on Therapy, 3:111 (Nov.) 1958. • 7. Monographs on Therapy, 3:137 (Nov.) 1958. • 8. Howell, C.M., Jr.: North Carolina M.J. 19:449 (Oct.) 1958. • 9. Bereston, E.S.: South. M.J. 50:547 (April) 1957.

And whatever the topical corticoid need, a suitable Squibb formulation is available—Kenalog-S Lotion—7½ cc. plastic squeeze bottles. Each cc. supplies 1.0 mg. (0.1%) triamcinolone acetonide, 2.5 mg. neomycin base and 0.25 mg. gramicidin. Kenalog Cream, 0.1%—5 Gm. and 15 Gm. tubes. Kenalog Lotion, 0.1%—15 cc. plastic squeeze bottles. Kenalog Ointment, 0.1%—5 Gm. and 15 Gm. tubes.

RELIABILITY SQUIBB

SQUIBB

Squibb Quality — the Priceless Ingredient

'SPECTROCIN'®, 'MYCOSTATIN'®, 'PLASTIBASE'®, 'MYCOLOG' AND 'KENALOG' ARE SQUIBB TRADEMARKS

PAIN Zactirin®

Ethoheptazine Citrate with Acetylsalicylic Acid, Wyeth

for everyday pain control . . .

for your many patients requiring potent analgesia but not an injected narcotic

Proved by extensive evaluation[1,2,3] in 1998 patients in diverse areas of medicine and surgery, including:

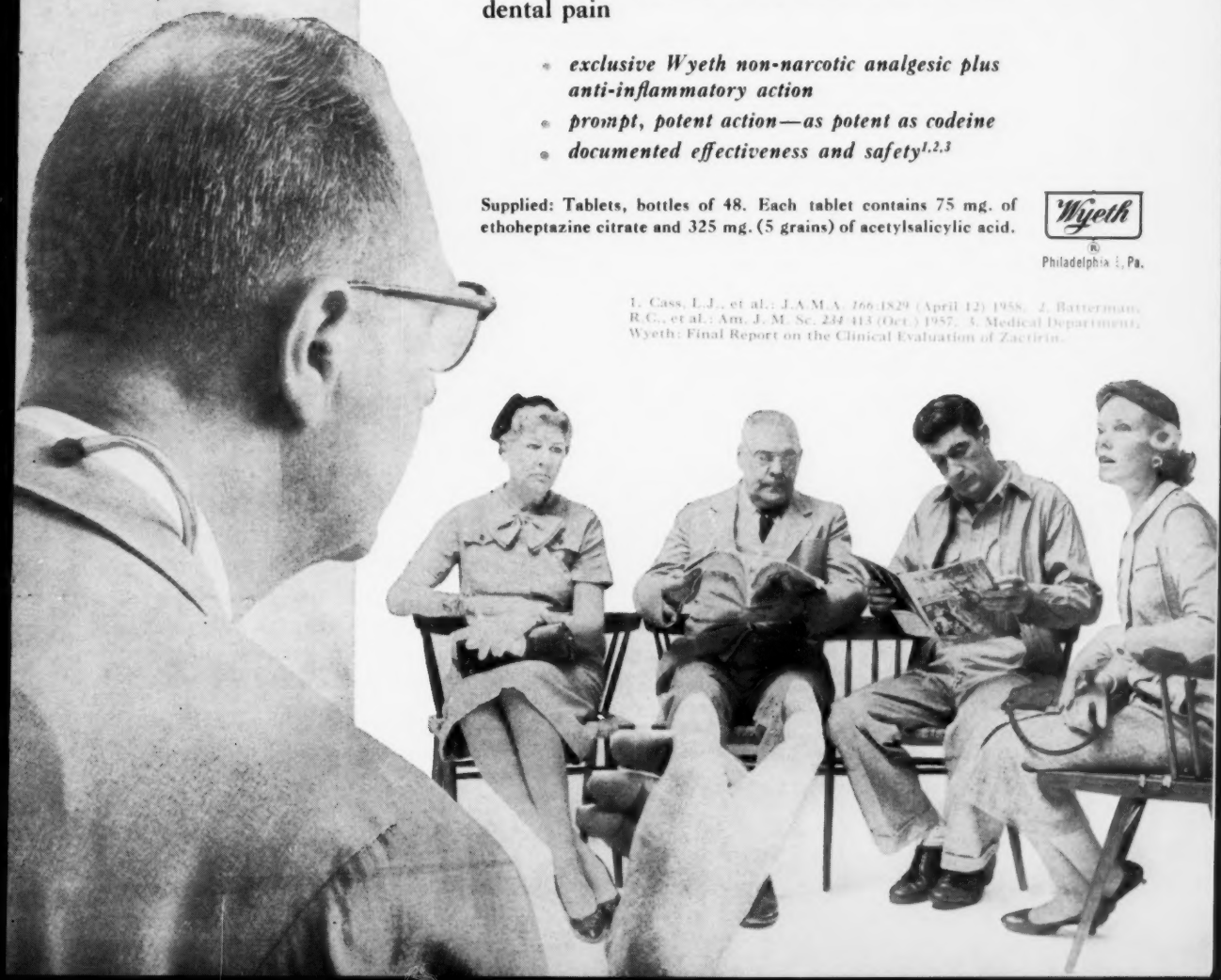
arthritis, bursitis, early metastatic carcinoma, fibrositis, grippe, herpes zoster, ligamental strain, low back pain, menstrual pain, myalgia, myositis, neuritis, pleurisy, postoperative pain, postpartum pain, sciatica, trauma, dental pain

- ***exclusive Wyeth non-narcotic analgesic plus anti-inflammatory action***
- ***prompt, potent action—as potent as codeine***
- ***documented effectiveness and safety[1,2,3]***

Supplied: Tablets, bottles of 48. Each tablet contains 75 mg. of ethoheptazine citrate and 325 mg. (5 grains) of acetylsalicylic acid.

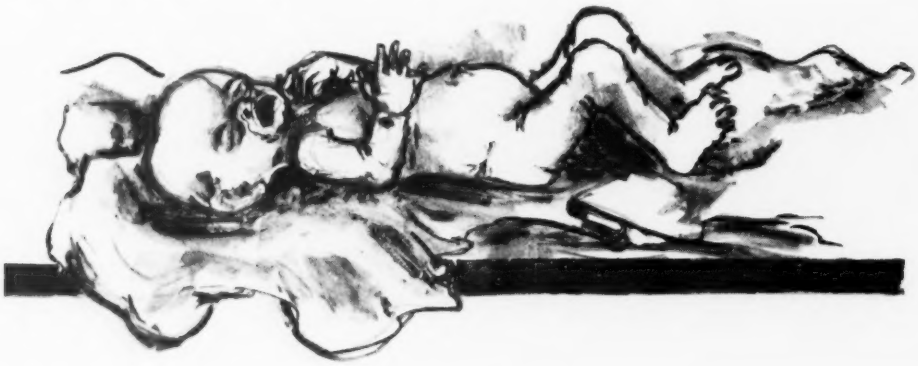
Wyeth®
Philadelphia 1, Pa.

1. Cass, L.J., et al.: J.A.M.A. *166*:1829 (April 12) 1958. 2. Batterman, R.C., et al.: Am. J. M. Sc. *234*:413 (Oct.) 1957. 3. Medical Department, Wyeth: Final Report on the Clinical Evaluation of Zactirin.



VERSATILE FURACIN

effective by intrapleural instillation[1]



the situation: Four-month-old infant with staphylococcal pneumonia and empyema resistant to most antibiotics was allergic to antibiotic chosen after sensitivity tests. Thoracentesis produced 30-40 cc. of creamy, purulent fluid. Organism was Staphylococcus aureus, coagulase positive.

then Furacin was instilled: 0.2% Solution was diluted equally with physiologic saline and 10 cc. of mixture instilled twice daily into pleural space, with suction catheter clamped off for 1 hour. Fluid almost immediately became thinner and less viscous. Twenty-four hours later infant was less irritable, voluntarily started taking food. Instillations stopped. FURADANTIN® Oral Suspension prescribed. Recovery uneventful.

1. Perkins, J. L.: Kansas State M. J. (to be published).

FURACIN®

brand of nitrofurazone

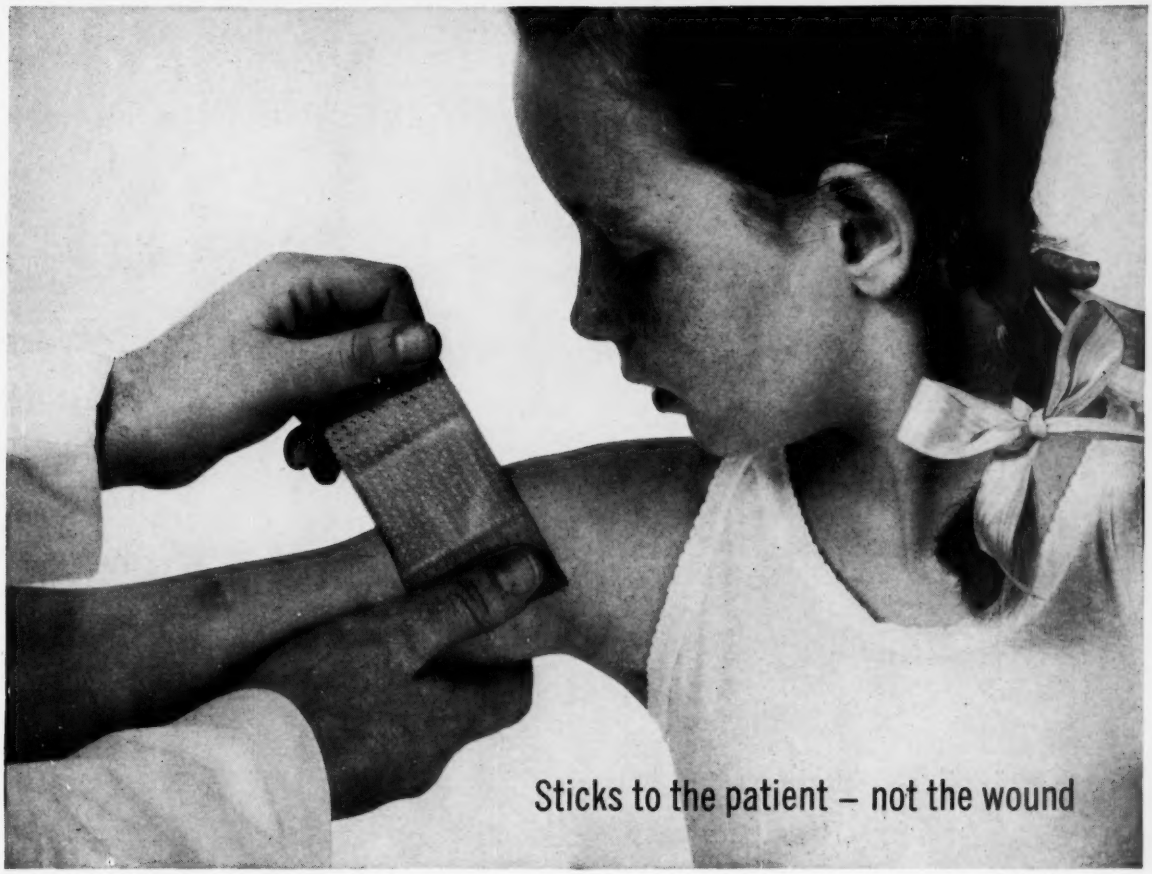
FURACIN has been in clinical use for more than 13 years. Today it is the most widely prescribed single topical antibacterial agent. Like other nitrofurans, FURACIN remains effective, even in pus, sera or exudates, against pathogens which have developed—or are prone to develop—resistance to antibiotics.

FURACIN, in a water-miscible base of polyethylene glycols, is available in a number of dosage forms. Included are Soluble Dressing, Soluble Powder, Solution and Cream. Also in Vaginal Suppositories, Inserts, and in special formulations for eye, ear and nose.

NITROFURANS—a unique class of antimicrobials—neither antibiotics nor sulfonamides

EATON LABORATORIES, NORWICH, NEW YORK

HELPING THE HANDS THAT HEAL



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Steripak® Non-Adhering Dressing

for office use

A completely self-contained sterile dressing. Excellent for covering incisions, small wounds and abrasions.

Available in handy dispensing box.

Johnson & Johnson

With PHENAPHEN 'ROBINS' for medical relief of pain—

"THE AMOUNT OF LOST TIME ...WAS GREATLY REDUCED"

*— reports this industrial physician**

In his recent on-the-job study of pain relief in industrial practice, Murray* observed that:

1. Phenaphen is more effective than a standard aspirin-phenacetin-caffeine formula for relief of moderate to severe pain . . .

2. Phenaphen is free from side effects despite its greater analgesic action . . .

3. Phenaphen is safe for machine operators since it is free from soporific effects, and thus permits returning to work or driving home with complete safety . . .

4. The superiority of Phenaphen is shown by the fact that "the amount of lost time . . . was greatly reduced."*

Formula: Each capsule contains:

Acetylsalicylic acid (2½ gr.)	162 mg.
Phenacetin (3 gr.)	194 mg.
Phenobarbital (¼ gr.)	16.2 mg.
Hyoscyamine sulfate (1/2000 gr.)	0.031 mg.

Dosage: One or two capsules as required. In industrial practice, Murray noted that "because of the complete absence of side effects, it is justifiable to increase the medication to two tablets every four hours."*

Supply: Bottles of 100 and 500 capsules.

*Dr. R. J. Murray, Medical Dept., Sperry Gyroscope Co., in an article published in the New York State Journal of Medicine, August 15, 1953 (Vol. 53, No. 16).

PHENAPHEN®

Robins

— superior analgesic for ambulant patients
*—"satisfactory for everyday industrial use"**

For more severe pain, Phenaphen is also available with varying dosages of codeine added to the basic formula, providing greater analgesia, free from the habituation hazards of addicting narcotics, as:

PHENAPHEN WITH CODEINE PHOSPHATE ¼ GR. *(Phenaphen No. 2)*

PHENAPHEN WITH CODEINE PHOSPHATE ½ GR. *(Phenaphen No. 3)*

PHENAPHEN WITH CODEINE PHOSPHATE 1 GR. *(Phenaphen No. 4)*

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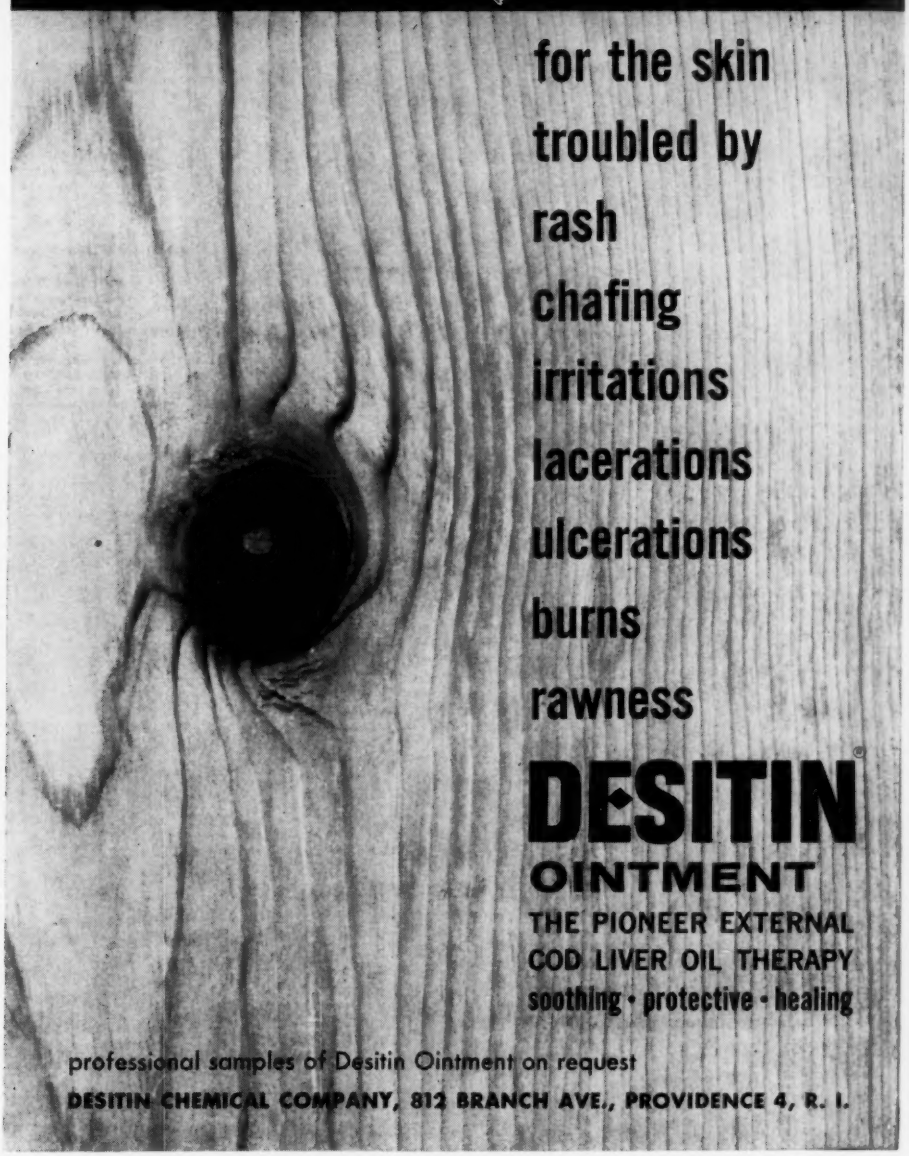
Ethical Pharmaceuticals of Merit since 1878

BASIC
THERAPY



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troubled by
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ulcerations
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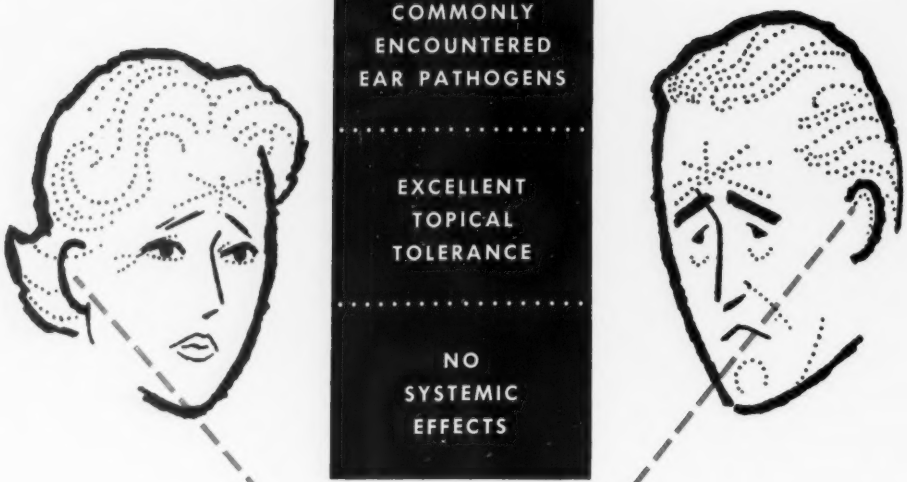

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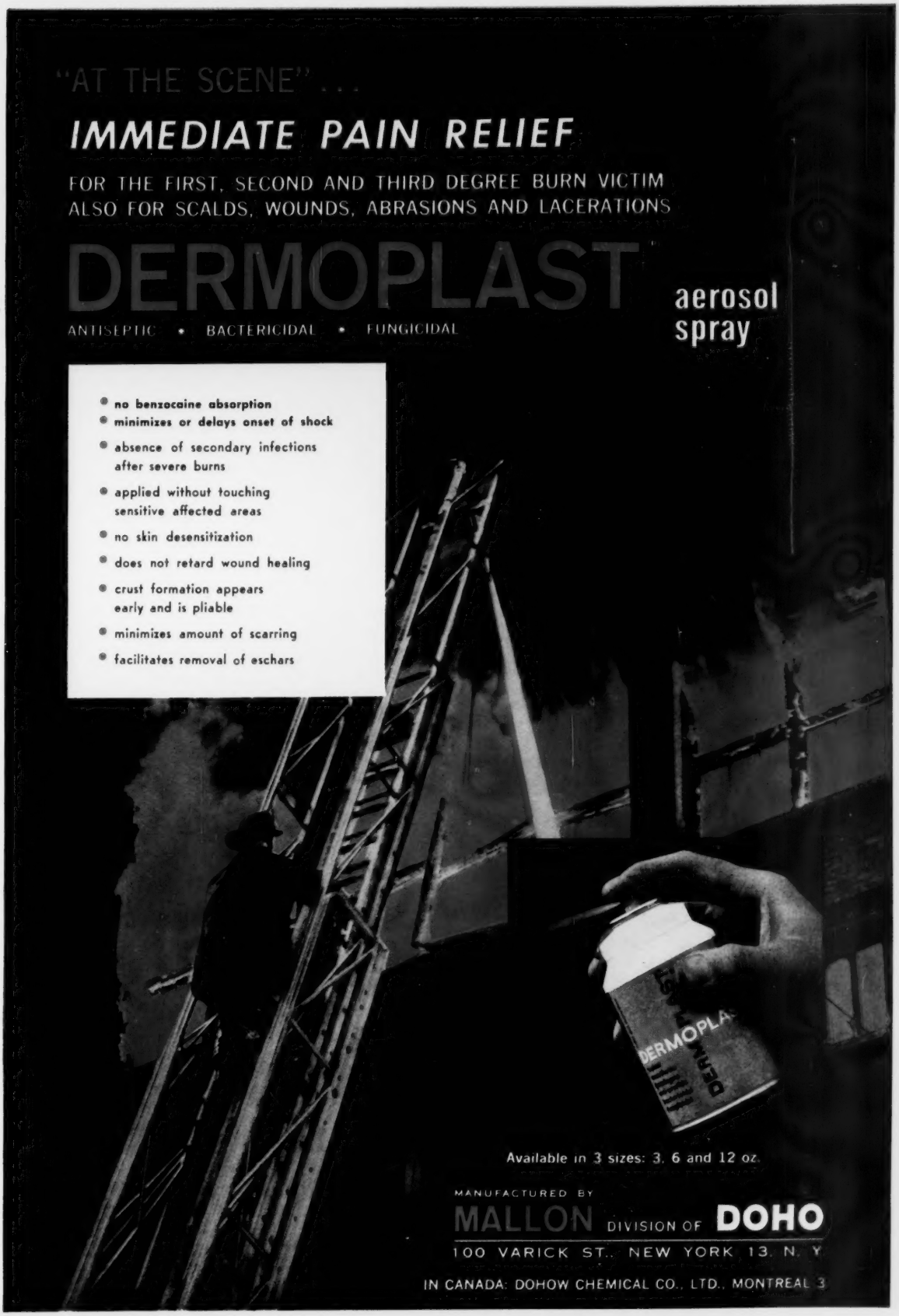

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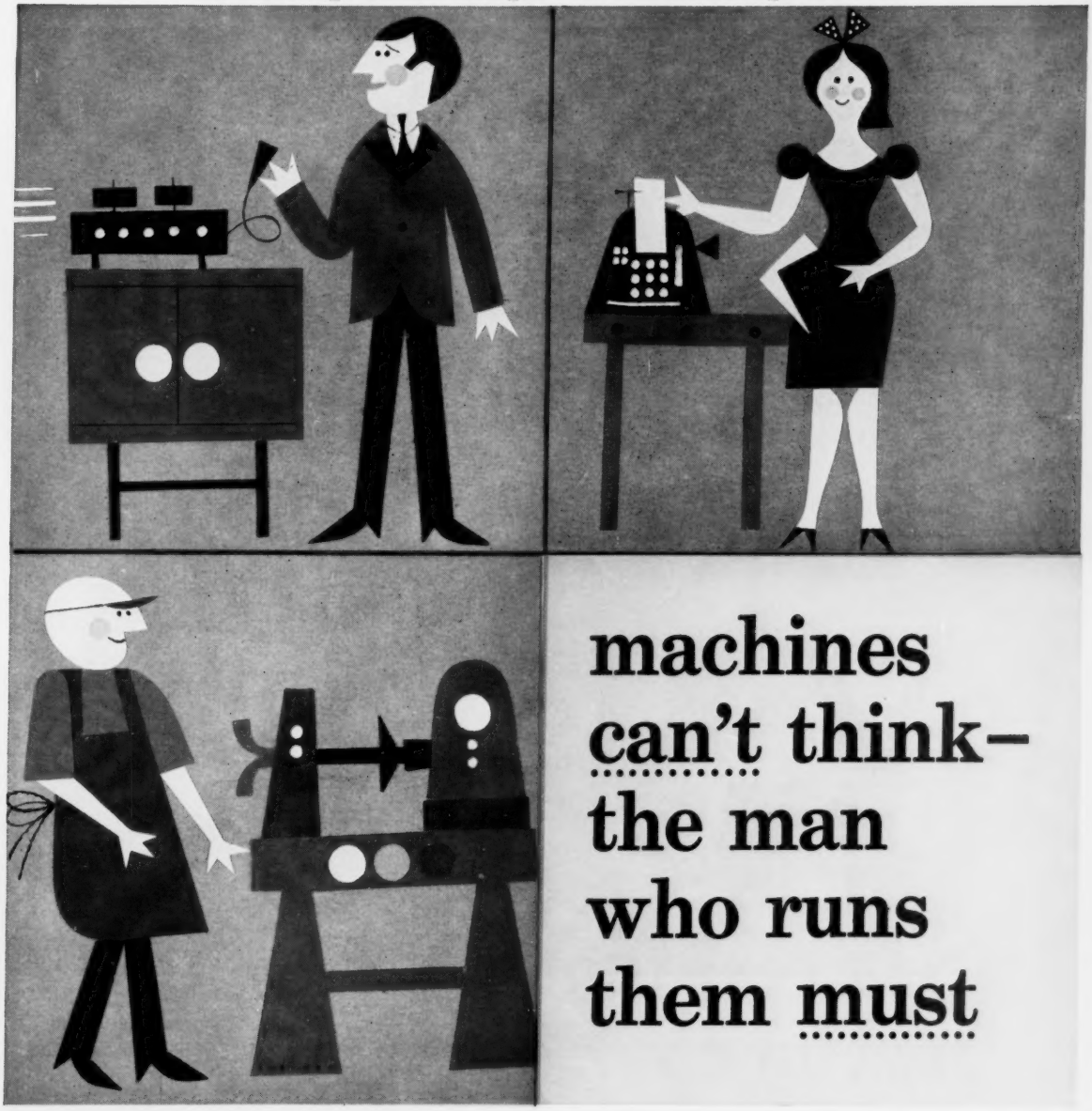

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References: 1. Ayd, F. J., Jr.: New York J. Med. *57*:1742 (May 15) 1957. 2. Bayart, J.: Presented at the International Congress of Pediatrics, Copenhagen, Denmark, July 22-27, 1956. 3. Cohen, S.: Am. Pract. & Digest Treat. *8*:946 (June) 1957.

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ALLERGY in the RUBBER INDUSTRY

- REX H. WILSON, M.D.
  Medical Director
  B.F. Goodrich Company
- E. H. PLANCK, M.D., and
- W. E. McCORMICK
  Akron, Ohio

Contact with chemicals now accounts for ninety percent of the occupational allergies, but observance of the industrial hygienists' statement, "You can use anything safely if you use it properly," protects all but the most super-sensitive individuals.

Occupational dermatitis and occupational allergies are fairly common diseases in the rubber industry, the terms "rubber itch" and "rubber poisoning" being frequently applied to the condition. Rubber manufacturing primarily is a series of chemical processes. Early in the industry's history, most of the medical problems were similar because of the use of the common ingredient, natural rubber. During World War II, the character of manufacturing in each of the large rubber companies changed. The B. F. Goodrich Company, for example, introduced to the industry man-made rubber. This, being entirely a chemical process, caused the creation of many new manufacturing methods. Many of the rubber companies branched out into various other fields; some made guns, some made airplanes, others made insecticides, fertilizers, paints, varnishes, plastics of all types. In fact, because the diversification became so ubiquitous, there was no company which could be classified as being solely a rubber manufacturer. Along with this diversification, the cases of occupational diseases, including cases of chemical allergy, increased in number.

The industrial physician recognizes that the lack of cleanliness is a primary cause of occupational allergies. In our industry much progress has been made in cleaning up the plants. It is indeed a revelation to the old-time rubber worker to go into a new, modern tire factory. The entire plant is almost spotless. Even carbon black is handled so that very little of this dirty material enters into the air.

Presented by Dr. E. H. Planck to the Midwest Forum of Allergy, Detroit, Michigan, December 7, 1958.

Contact with chemicals now accounts for fully 90% of all of our occupational allergies. The control of exposure to chemicals is largely the responsibility of the industrial hygienist. He tells us how to ventilate the plants and how to handle the materials. The Industrial Hygiene Department of The B. F. Goodrich Company has as its slogan, "Anything can be handled safely by using the proper method." Therefore, while discussing some of our contact dermatitis cases and their causes, I must say that occupational dermatitis actually presents not a serious, but rather a continuing, problem to us because our industrial hygiene methods are good enough to prevent mass exposures to irritating substances. In other words, the cases that do occur are usually true sensitivities of certain individuals to certain chemicals.

We see very little dermatitis owing to physical causes such as heat, cold, electricity, sunlight, x-rays and radium. Our blondes and redheads do get sunburned. We do have senile keratoses which develop into skin cancer. Of course, we have electric burns, frost bites, etc. We do have some mechanically caused dermatitis from friction, trauma and pressure, but it is the chemical agents that cause the greatest number of our cases of occupational dermatitis and disease.[1] We use large amounts of solvents, petroleum products, alkalies, acids, cleansers and detergents. All of these cause dermatitis in some people. We use such primary irritants as unleaded gasoline, hexane and methylethylketone in our manufacturing processes. We use hydrochloric and sulfuric acid. We use sodium hydroxide, potassium hydroxide and caustic soda. The improper handling of any of these may result in a case of dermatitis. We use a number of sensitizers such as accelerators, antioxidants, softening oils, phenolformaldehyde resins and epoxy resins.

The epoxy resins[2] are synthetic resins of recent origin. They, along with their curing agents and some additives, present various dermatological hazards. The epoxy resins can also cause conjunctivitis, rhinitis and asthma. They are both liquids and solids, and in their liquid state represent severe skin sensitizers and skin irritants. Workers may use solvents to remove the epoxy compounds from their skin. This, too, is dermatitis producing in some instances.

When it is known or suspected that an individual may be exposed to allergens or sensitizers, The B. F. Goodrich Company issues to the worker one or more of several standard protective devices, depending upon the type of exposure. These items are long sleeved coveralls, rubber boots, gloves, masks and Kerodex protective cream. The Kerodex cream is manufactured by Ayerst Laboratories, Incorporated, and is of two types; Kerodex No. 51 which is water miscible for dry work and Kerodex No. 71 which is water repellent for wet work. These measures are effective in preventing trouble.

At The B. F. Goodrich Company, when a worker reports to the Medical Department complaining of a skin rash or of asthma, the cause of which he attributes to contact with some offending agent used in his work, a definite procedure is used. A detailed history is taken including specific questions as to possible direct exposure to chemical agents. A careful physical examination is done covering all areas of complaint and any indicated laboratory procedures are completed. The physician evaluates the information thus obtained and records his diagnostic impression. If it is thought advisable, the patient is told to report off sick until the investigation is completed. Next, the physician contacts the industrial hygiene department, presents his findings and asks for an immediate investigation of the employee's working environment. If the investigation reveals that the worker is contacting possible allergens or sensitizers, the employee's department management is directed to take immediate steps to correct the faulty operation. If only innocuous substances are found to be present and the patient does not respond rapidly to treatment, consultation with a specialist is requested. The specialist is furnished with samples of all materials used in the patient's department so that he may conduct allergy tests. If the consultant decides that the patient has a job allergy and the contributing factors cannot be successfully controlled, the patient is given a new job assignment.

Here is a specific illustration in the form of a brief case report: W.G.S., age 35, Caucasian male, was discharged from the army on September 1, 1958, in excellent physical condition. There was no history of previous allergy. He returned to his old job at the B. F. Goodrich Company on October 8, 1958, and encountered no difficulties with his work. On October 18, 1958, he was placed on a different job which required that he repeatedly spray very hot tire molds with an aqueous soap solution containing a silicone. The soap vaporized rapidly owing to the heat of the molds. The patient stated that this vapor immediately caused his eyes to burn and smart and his nose to run. About two hours after leaving work he complained of "tightness in the chest," difficult breathing, some nonproductive cough and most of the symptoms of what he termed "chest cold." On weekends, after he had not been working for 36 hours, he noticed that these symptoms subsided spontaneously. He continued on the job

until November 4, 1958, at which time he felt he could no longer work. He reported to the Medical Department on November 7, 1958. The physical examination at that time, which was at least three days after his last exposure, revealed no conjunctivitis or rhinitis. A few scattered rales could be heard over both lungs. His vital capacity was measured and found to be 3,350 cc (our normal capacity for this individual is 4,120 cc). The impression of the physician was that the man was suffering from an allergic conjunctivitis, rhinitis and asthma owing to chemical irritation. His case was referred to the industrial hygiene department. Investigation revealed that the compound being used as a spray contained a small quantity of soap, silicone oil and ammonia. The industrial hygienist reported that the odor of ammonia was barely noticeable when the spray was used and that, in his opinion, there was no health hazard involved in the use of the material. Considering this information, the physician felt that the individual was probably unusually sensitive to small amounts of the materials being used. He was transferred away from contact with this material. Fortunately, he has been symptom free since then.

Schwartz[3] refers to many accelerators, particularly hexamethylenetetramine, as causing allergic dermatitis. He also refers to a number of antioxidants, especially emphasizing that a leukoderma can be derived from monobenzylether of hydroquinone.

Fortunately, there is comparatively little occupational disease occurring in workmen engaged in the manufacture of man-made rubber despite the many irritant chemicals used. Dr. Schwartz[3] attributes this to the fact that the factories making this material are modern, well equipped plants. This again emphasizes the importance of cleanliness and proper handling of materials.

Sporadically, we hear of a person using a finished rubber product, such as a rubber glove or a rubber boot, having an outbreak of contact dermatitis. It is a tragedy when a surgeon is forced to give up his work because he is unable to wear rubber gloves. As a solution to this problem, special purpose gloves can be made in which the offending ingredient is removed. Rubber itself is nonirritating to the skin. The various chemicals which are used to make it into a useful product may be irritating to the skin of sensitive individuals. Whenever dermatitis is suspected to have been caused by a rubber product or compound, patch tests are performed in order to determine the offending material. The patch should be left on for 48 hours, and if a positive reaction results, further steps can then be taken to remove the offending ingredient or ingredients in the material. Of course, the problem of the sensitive individual is one of all industry. The modern industrial hygienist with his slogan, "You can use anything safely if you use it properly," has reduced the incidence of the sensitivity problem to the point that it is necessary to deal with very few people who have high-level sensitivities and who must be removed, as a matter of their own protection, from contact with the offending materials. Obviously, there are a few people who just cannot work in the rubber industry because of their sensitivities.

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1. Occupational Dermatoses — Predisposing and Direct Causes. *J.A.M.A.*, 167:2203, August 30, 1958.
2. George E. Morris: Dermatological Hazards From Epoxy Resins. *Clinical Medicine*, September, 1958.
3. Louis Schwartz, Louis Tulipan and Donald J. Birmingham: "Occupational Diseases of the Skin." *Dermatoses in the Manufacture of Rubber*, 574-595, 1957.

Handling Isopropylamine

Safe handling practices for isopropylamine, pungent ammonia-like liquid used industrially as an intermediate in the synthesis of pharmaceuticals, rubber chemicals, dye stuffs and insecticides are described in a chemical safety data sheet just issued by the Manufacturing Chemists' Association.

Classified by the Interstate Commerce Commission as a flammable liquid, isopropylamine can be ignited even by a spark. It can cause skin and eye burns and irritant damage to the lungs.

MCA's 15-page booklet details the hazards of the chemical and describes their control through preventive engineering, employee training and the use of protective equipment. Other sections deal with handling, storage and waste disposal and adequately cover the medical aspects and necessary first aid.

Copies of "SD-72, Isopropylamine" are available at 30 cents each from the Manufacturing Chemists' Association, 1825 Connecticut Avenue, N. W., Washington 9, D. C.

Relation of Interrupted Pulsed Microwaves to

Biological Hazards

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Experiments with rats indicate that by choosing a certain cycle for interruption of transmission, it is possible to reduce the hazard from microwave exposure.

In our studies a pulsed magnetron from radar gear was used to generate microwaves with a frequency of 24,000 megacycles or a wave length of 1.25 cm. The duty cycle is 0.0006 or 0.06%. The peak output was 40,000 watts, but because of the duty cycle, experiments were conducted with an average power output of 21 watts.

In another communication,[1] we concluded that intermittent exposures to microwaves emphasized the potency of prolonged action of this form of energy more than did a continuous exposure. Continuous exposure (0.3 watts per sq cm; rat, prone position, total body exposure) killed a rat in 15 minutes; intermittent exposure to 50% of this energy per unit of time (one minute of exposure followed by one minute of nonexposure, etc.) over a period of 31 minutes, killed in 16 minutes of *actual* exposure time. Seventeen percent of the above microwave energy per unit of time (exposure: one minute followed by five minutes of nonexposure, etc.) killed rats in 34 minutes of *actual* exposure time. These and related data indicated that besides species, power density and other factors, microwave radiation effects depend largely on the period of exposure and the recovery period after exposure.

It was considered possible to influence further the effects of microwave exposure by altering the exposure and nonexposure times (in secs), but by keeping their ratio constant.

In the first group of experiments a ratio of 1:1 was maintained. For instance, instead of exposing an animal for 60 seconds, followed by a nonexposure period of 60 seconds, exposure and nonexposure periods were each kept equal to 30, 15, 5 and 3 seconds, respectively. In subsequent experiments, the ratios of time *on* to time *off* were 1:2, 1:3, 1:4 and 1:5 (Figure 1).

Table I presents the data. These demonstrate that the period of survival of an animal increases as the period of exposure decreases, in spite of the fact that the *actual* period of exposure per unit period of time remains constant. To quote certain experiments conducted with a 1:3 ratio, exposure for 15 seconds followed by a nonexposure period of 45 seconds, or 15 seconds of exposure over 60 seconds, killed all four rats in 55 (from 50 to 60) minutes of actual exposure time; while exposure for three seconds followed by a nonexposure period of nine seconds, also adding up to 15 seconds of exposure over a 60 second period, killed two rats in 105 and 115 minutes, with two surviving. (The experiment was discontinued after 120 minutes of actual exposure over a period of eight hours.)

Conclusions

By choosing a certain cycle for interruption of transmission — without altering the output of microwave energy per unit of time — it is possible to reduce the hazard from microwave exposure. The significance of our observations is obvious. Although only one frequency (24,000 megacycles) was used in these experiments, it seems reasonable to assume that this finding will also apply to other wave lengths of either pulsed or CW microwaves.

Reference

1. "Acute Effects of Microwave Radiation on Experimental Animals (24,000 Megacycles)." Accepted for publication in the *Journal of Occupational Medicine.*

Presented at the Microwave Investigator's Conference, Patrick Air Force Base, Patrick, Florida, January 15 and 16, 1959.

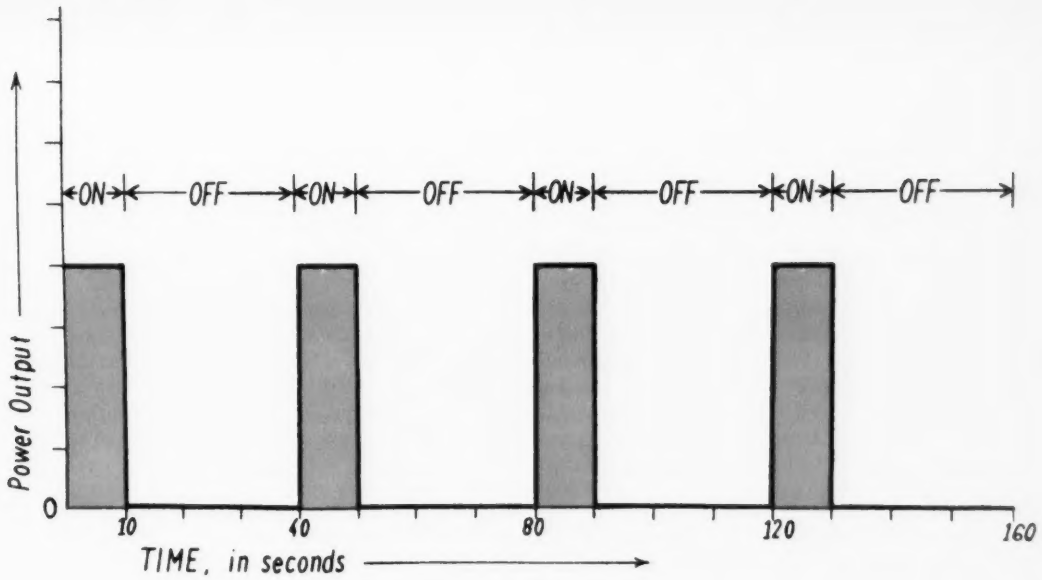

Figure 1

Operation of interrupted, pulsed microwave generator.

Ratio of 1 to 3, exposure 10 seconds followed by nonexposure period of 30 seconds.

TABLE I.

EFFECT OF INTERMITTENT EXPOSURE TO MICROWAVES (24,000 MC) ON THE MORTALITY OF RATS

Rats (200 to 275 g) immobilized in Plexiglas and screen holder; exposure of lumbar region; approximately an equal number of males and females in each group of four rats; power density 0.30 watts/cm^2; half power diameter 6.35 cm.

Period of Time (sec) Transmitter is "On"	Period of Time (sec) Transmitter is "Off"	Ratio of Exposure to Nonexposure	Lethal Exposure Time (min)	
60	60	1:1	16.5	(15, 15, 18, 18)
30	30		18	(16, 18, 19, 19)
15	15		28	(25, 27, 28, 32)
5	5		28	(26, 28, 28, 30)
3	3		40	(35, 37, 38, 52)
30	60	1:2	39	(35, 37, 37, 47)
15	30		54	(45, 53, 55, 62)
10	20		65	(60, 63, 68, 69)
5	10		82	(72, 77, 83, 96)
3	6		95	(90, 95, 96, 100)
60	180	1:3	28	(18, 25, 32, 36)
30	90		51	(45, 51, 52, 56)
15	45		55	(50, 55, 56, 60)
10	30		76	(72, 75, 76, 80)
5	15		100	(90, 110; 2 survived 120 min*)
3	9		110	(105, 115; 2 survived 120 min*)
1	3		118	(3 survived 120 min*)
30	120	1:4	70	(65, 69, 71, 75)
25	100		85	(3 survived 100 min*)
20	80			(all survived 100 min*)
15	60			(all survived 100 min*)
60	300	1:5	34	(26, 33, 37, 40)
45	225		69	(3 survived 80 min*)
30	150			(all survived 80 min*)
15	75			(all survived 80 min*)
10	50			(all survived 80 min*)

*Actual exposure time

RADIATION HAZARDS

Resulting from Clinical Use of Radioactive Isotopes

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Radiology Department
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• RAYMOND E. PARKS, M.D.

The use of radioactive substances for diagnosis and treatment since 1946 has introduced an entire new spectrum of occupational hazards. However, the hazard of isotopes is much less than that of diagnostic or therapeutic x-ray.

The use of radioactive substances in the diagnosis and treatment of disease has become widespread throughout the world since 1946. Much of the use of radioactive isotopes in medicine is still in the realm of research, and in this discussion we shall confine ourselves to only those uses of radioactive substances that have proved to be of practical routine utility.

Of the isotopes which are routinely used, radioactive iodine is foremost. Radioactive iodine is used as a diagnostic tool to study thyroid function by determining the rate of iodine uptake by the thyroid gland. The level of thyroid function may also be deduced by determination of the protein bound iodine fractions of the blood. Although there are many variations to the method and dosage employed in a radioactive iodine tracer study for thyroid disease, the majority of tests are done with a dosage not exceeding 50 microcuries. Such a dosage of radioactive iodine, even if completely retained by the body to undergo its complete physical disintegration, without any biological excretion, would result in a total body radiation exposure for the patient of an amount of radiation that is usually received in a routine chest x-ray. Radioactive iodine is used in other chemical forms in routine diagnostic tests. It is often used as the labeling agent in biochemical studies. Radioactive labeling of fats provides a simple method of studying fat absorption from the intestinal tract. Radioactive iodine labeling of substances excreted by the kidney allows one to study the rate of urinary excretion by the kidney, rather than in the collected urine specimen, since by radioactive methods one may place the detector over the kidney area and actually determine the rate of excretion by the kidney at the time of excretion. Human serum albumin labeled with radioactive iodine is used to measure the total plasma volume, or indirectly the total blood volume. Also, in such form it may be used for the localization of brain tumors and for circulation time studies in various parts of the body. By labeling the blood with such radioactive albumin, one can study the circulation time from the right side of the heart to the left side of the heart, and from this information one can calculate the stroke volume of the heart. Radioactive iodinated rose bengal has proven a valuable liver function test for studying the function of the liver pyramidal cells.

Radioactive iodine is used in therapeutic amounts for the control of hyperthyroidism. Radioactive iodine has become the treatment of choice for diffuse hyperplastic toxic goiter in patients over the age of 40. It is effective in almost all patients, and often requires only a single oral administration of the radioactive iodine. Although not the treatment of choice, it is also used effectively to treat toxic nodular goiter and hyperthyroidism in patients under the age of 40 in which surgery is contraindicated for some reason. The only absolute contraindication to the use of radioactive iodine in the treatment of hyperthyroid states is pregnancy,

since the administration of radioactive iodine after the third month of pregnancy might result in atrophy of the fetal thyroid. Radioactive iodine in larger therapeutic amounts is used to produce a permanently decreased thyroid state which has proved of therapeutic benefit in over 50% of patients with intractible cardiac failure or angina pectorus. It has also been used in the same manner to produce symptomatic improvement in patients with severe emphysema and in other states associated with a severe diminution of the respiratory capacity.

Inasmuch as practically all radioactive iodine is stored or concentrated in the thyroid gland 48 hours after administration, whether used in tracer studies or for therapy, whole body irradiation is minimal and of no significance.

Radioactive phosphorus is used today for diagnostic studies to detect brain tumors at the time of surgical exploration of the skull, and is used preoperatively for localization of eye tumors, particularly those located in the anterior hemisphere of the eyeball.

Radioactive phosphorus is used therapeutically to produce a reduction of the circulating blood count in polycythema vera and in this condition appears to be the drug of choice at the present time. Remissions induced with P-32 usually last for a period of six to 18 months.

Radioactive phosphorus has also obtained wide acceptance as a medium of palliation of breast tumor osseous metastases. Radioactive phosphorus given with steroid therapy has, in the hands of some observers, produced much better results than the administration of steroids alone.

Radioactive chromic phosphate and radioactive gold are used in insoluble colloidal suspensions for injection into serous cavities for the reduction of fluid accumulation. These materials are used to reduce the ascites and pleural effusions which result from metastatic tumor. The result is only palliative and has no significant effect on the duration of the disease.

Radioactive chromium has proved a useful tool to the hematologist. Chromium in the form of chromate will pass through the red cell membrane and become fixed within the red cell. Chromium in the form of chromic-51 chromate remains in the plasma and is rapidly excreted by the kidneys. It is therefore possible to withdraw blood from a patient and in vitro label the red cells with radioactive chromate. Reinjection of such labeled red cells allows a simple method for determining red cell mass, blood volume and red cell survival time. Simultaneous labeling of the plasma with radioactive human albumin allows one to study all of the components of the blood. With radioactive sodium or sulphur, one can label the extracellular fluids of the body and determine the total extracellular fluid. By knowing the blood volume one can therefore calculate the interstitial extracellular fluid of the body.

With phosphorus 32, the concentration is principally in bone marrow where calculated effect or depression is desired and expected. The radiation hazard in the therapy of malignancies is a calculated risk with any source of irradiation.

Radioactive iron and radioactive cobalt have also proved of diagnostic value to the hematologist. Utilizing radioactive iron, one may study the serum iron and the rate of iron metabolism which provides valuable information in the understanding of hematological disorders. Radioactive cobalt is used to label vitamin B-12 and this material is administered orally in minute amounts. The absorption of B-12 from the intestinal tract can be studied by determining the uptake of this material in the liver, or the rate of excretion in the urine or stool. In patients with pernicious anemia and malabsorption syndromes such as sprue, the absorption of B-12 is markedly diminished. To differentiate between these states, the test may be repeated utilizing the intrinsic factor of pernicious anemia in addition to the radioactive B-12. If the patient has pernicious anemia, the repeat study will be normal because one has supplied both the extrinsic and intrinsic factors of this disease. Whereas, if the patient has a malabsorption syndrome such as sprue, the test will continue to show the failure of absorption of B-12. In these diagnostic procedures also, the radiation hazard is minimal and equivalent to an ordinary chest x-ray examination.

Radioactive cobalt as well as other radioactive isotopes are, of course, used as external sources of radiation to be used as substitutes for radium or x-ray therapy. The use of large amounts of cobalt in the form of a teleocobalt unit is familiar to everyone. The use of radioactive cobalt in sealed sources as a substitute for radium has done much to reduce the public health hazard of radium. Since radioactive cobalt is a solid substance, produces no intermediate radioactive substances and is not retained by the human body, it forms an almost ideal substitute for radium. Radium, on the other hand, constitutes one of the least desirable radioactive substances to be used as a sealed source, since its metabolism is such that it is retained by the bones of the body for a prolonged period of time; it is readily absorbed from the tissues of the human body; it has an intermediate product which is gas, radon, and may be absorbed by respiration; and radium is a soluble salt rather than a solid metal. The radium used in the treatment of an average case of carcinoma of the uterus would be sufficient to produce a fatal poisoning in several thousands of

humans if all of this material were distributed equally amongst its victims. A similar amount of radioactive cobalt would not produce a fatal reaction even if ingested by a single person since it would be readily expelled from the body.

The use of radioactive isotopes in medicine has posed special problems with regard to radiation protection, although the degree of exposure is actually less than personnel exposure in diagnostic x-ray or x-ray therapy. The radioisotope laboratory, unlike the other divisions of the Department of Radiology, does present the hazard of accidental contamination of personnel by internal ingestion of radioactive material or external contamination. Only by meticulous housekeeping in the radioisotope laboratory, restricting the location of radioactive isotopes to a single area and strictly limiting the number of personnel who might come in contact with these materials, can internal ingestion accidents be completely eliminated. The prevention of external contamination is also dependent upon following good isolation technique; however, accidental breakage might at times produce contamination of personnel with radioactive material. To prevent such external contact, the use of working uniforms that are readily replaceable and the wearing of nonabsorbable aprons is a necessity in the handling of therapeutic amounts of radioactive isotopes. Shower facilities should be available for immediate use by personnel who might accidentally become contaminated. In practice, if one observes good laboratory technique, the occasion should never arise where there is any contamination of personnel.

The hazard of radiation reaching personnel in the isotope department from radioactive sources, either in vitro or in the patient, is relatively small compared to diagnostic x-ray facilities. Usually a few feet of distance is adequate to reduce the exposure dosage below the maximum tolerance when even the largest therapeutic doses of radioactive isotopes are being used. Tracer doses of radioactive isotopes present no significant radiation hazard to the personnel utilizing these doses.

The significance of the radiation exposure to the patient is a very involved problem of which space does not permit consideration in detail. The situation is different for each of the isotopes because of their physical characteristics and because of their biological behavior in the human body. Tracer amounts of isotopes by definition are well within the maximum tolerance for safe radiation, and a single tracer amount should, under the most adverse conditions, produce no significant radiation hazard to the patient. Therapeutic doses, however, often approach the level of unsafe radiation exposure, and there may be accompanying acute radiation sickness, and later marrow depression. Since such doses of radioactive materials are only given for malignant diseases, one is usually not too concerned about possible remote reactions secondary to the radiation any more than one is concerned when giving x-ray therapy to a patient with malignant disease. Such patients receiving very large doses of radioactive isotopes must be hospitalized so that one may control the radioactive material. Since such material is often excreted in the urine or feces in significant amounts, it is necessary that these materials receive special handling so that other parts of the hospital will not be contaminated. In the event of death shortly after the administration of the radioactive materials, special instructions must be given to the pathologist before performing a post mortem examination, in order that the pathologist need not be exposed to dangerous radiation. The embalmer must also be informed of the hazard, particularly if a large amount of radiation is contained within the blood or some other body fluid which might be removed by the embalmer.

In summary, radioactive isotopes have produced special problems from the standpoint of radiation protection. However, in practice the hazard of isotopes is much less than that of diagnostic x-ray or x-ray therapy and the public health hazard is very small compared to the danger of radium. Personnel working with radioactive isotopes usually receive less radiation exposure than those working in other fields of medical radiology. Radiation hazards must be kept in proper perspective, neither fanatically avoided nor casually disregarded.

A Surface Analgesic

in Treatment of Musculoskeletal Affections

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With an analgesic to reduce pain, the therapeutic usefulness of exercise and massage in the treatment of musculoskeletal conditions is enhanced.

Physical therapy is often prescribed in the management of acute and chronic musculoskeletal conditions accompanied by pain. Within the scope of this form of treatment, massage is resorted to almost as a routine procedure. Its widespread use is indicated by such phrases as "baking and massage," "heat and massage," etc. It is not the purpose of this paper to discuss critically its rationale and efficacy, since this form of friction is universally accepted and applied when physical therapy is called for. The report is concerned, rather, with enhancing the therapeutic usefulness of massage by combining its administration with a topical analgesic.

Massage is ordinarily executed with an inert lubricating substance such as lanolin, mineral oil or talc. It appeared desirable to employ a preparation that might also have the added virtue of producing surface analgesia, when pain was one of the associated symptoms. It is well known that fatty substances can be absorbed percutaneously, especially with rubbing. Hence, any fat-soluble analgesic permeating deeply enough to sensory endings in the epidermis may be expected to alleviate pain of musculoskeletal origin or of the referred type. Injection of novocain has the same purpose. This hypothesis was tested by using during massage a lubricating preparation containing an analgesic substance in a fatty base.® The mixture consists of certain organic oils, 30% methylsalicylate and a fat soluble analgesic agent.

This work was carried out at the Institute for Crippled and Disabled, N. Y., N. Y., where Dr. Gordon was formerly Director of Medical Services.

®The material (Ger-O-Foam) was supplied by the Geriatric Pharmaceutical Corporation, Bellerose, New York.

Forty-one patients were treated for musculoskeletal disorders, both chronic and acute. Their ages ranged from 25 to 82 years and 55% were males. Of the chronic conditions, 30 patients represented osteoarthritis including the lumbar spine and large appendicular joints (6), painful limbs following a cerebrovascular accident and hemiplegia (5), the "low back syndrome" other than that due to osteoarthritis and radiculitis (4), rotator-cuff tendonitis (3), healed fracture (2), fibromyositis (2), herniated nucleus pulposus with radiculitis followed by operation (2), torn muscle (1), phantom pain in above-knee stump (1), rheumatoid arthritis of the lower spine(1), miscellaneous diseases (3, see case reports), and unknown diagnosis (1). The acute disorders included 11 patients with myositis, mainly of the trapezius muscle (4), sprain of joint (3), tear of muscle (2), costoscapular syndrome (1), rotator-cuff tendonitis (1). Table I and Table II set forth the findings in 37 cases, broken down into 26 "chronic" and 11 "acute" cases. The remaining four are considered in detailed case reports.

In this group of 37, the procedure first involved physical therapy including standard massage; then followed sessions of massage with the topical analgesic and, usually, exercises where indicated. In three acute cases no other treatment preceded use of the topical analgesic, as pain and loss of function were so severe that quick relief was desirable. As will be seen, the response to this treatment was so striking that an additional four patients with intractable pain owing to musculoskeletal symptoms were observed by the "blind testing" method, in order

to assay the influence of suggestion, which plays so important a role in chronic pain.

Results

It was difficult to ignore the pain-relieving efficacy of massage with topical analgesic. In addition, neither skin lesions nor other side effects were observed. Tables I and II present all pertinent data in 37 patients. Note that previous treatment had no effect even when liniments were used. In each patient the same therapist gave treatment who subsequently applied the analgesic preparation. In the chronic group, where one would not expect to get permanent relief, 58% of 26 patients received temporary alleviation of pain. This satisfactory result was often obtained without resort to application of heat. In cases 3 and 24, exercises, a more nearly definitive form of treatment for restoration of function, could be readily carried out because pain was no longer a restrictive factor. Twenty-seven percent of the chronic cases (7) reported complete relief. Five had conditions which had become chronic but which ordinarily would be expected to improve with proper treatment (see cases 23, 24, 26, 34 and 35, Table I); the sixth patient (Case 4) was diagnosed as an osteoarthritis with fibrositis and the seventh, (Case 1) had osteoarthritis of the knees. Hence, at least five of these seven exhibited responses within the range of expectation. Four (15%) responded not at all, as might have been anticipated from their clinical conditions.

When the acute category is considered (see Table II), all showed rapid improvement within 48 hours to two weeks. For example, Case 28 was "getting worse" on ordinary treatment; cases 31 and 33 could not accept exercises as part of the program because of restrictive pain. Following massage with the topical analgesic all admitted less pain, but objectively the acceptance of exercise was an even more cogent argument for the efficacy of this treatment.

The reaction to exercise is emphasized, because interpretations of subjective reports based on pain is vexatious to the investigator and of dubious value for the critical reader. In order to test further the impressions received from treating the 26 chronic and 11 acute conditions, four patients were selected with long standing pain owing to unalterable conditions. These were treated with the "blind test" method, to assay the psychological factors inherent in the complaint of pain. The procedure was carried out by substituting for the topical analgesic an inert preparation of similar consistency and odor (methylsalicylate) without the knowledge of the patient. Summaries follow:

Case 38: Frozen shoulder secondary to cervical rib on the left side with pain in the neck, upper thoracic region. Limited scapulohumeral motion measured 50° in abduction, 50° in flexion and 10° in internal and external rotation. Radiant heat, massage and passive and active exercises were administered for six weeks without improvement in pain or range of motion. In fact, exercises were impossible because of pain. Then the topical analgesic was added during the massage. Following each session pain in the shoulder was relieved for two hours so that exercises could now be tolerated with each treatment. After this response was established, for one week a placebo application similar in odor and consistency was substituted for the analgesic. No relief of pain followed. After three months of topical analgesic preceding the exercises, range of motion measured 120° in abduction, 130° in flexion, 50° in external rotation and 30° in internal rotation. Pain in the neck and upper back persisted but temporary relief of shoulder pain was received.

In this case pain prevented improvement of shoulder function and ordinary "heat and massage" were of no benefit. Topical analgesic brought improvement by relieving pain for two hours and by making exercises possible; while administration of a placebo preparation highlighted the efficacy of the active material.

Case 39: Gaucher's disease of 10 years' duration with severe pain in left hip and atrophy of disuse of the thigh and gluteal regions. Heat and massage over a period of weeks were without influence and active exercises for strengthening only caused the patient to cry with pain. Then, for three months, treatment consisted of massage with topical anlagesics and resistive exercises to quadriceps and glutei. After each session pain was relieved for eight to 10 hours and execution of exercises now offered no problem. During this time on four separate occasions the topical placebo was used. Upon the subsequent visit, the patient would remark that the preparation used on the previous visit "must have been different," as pain was unaffected.

Again, temporary relief was obtained, allowing the administration of exercises and the benefit of some comfort, brief as it was.

Case 40: Functional kyphosis with pain in midthoracic region for eight months. Many weeks of heat, massage and postural exercises yielded no benefit regarding the pain. Then for three months the topical analgesic was administered with massage, followed by postural exercises. The patient volunteered the information that pain was now moderate after each treatment, and comfort lasted for three to four hours. During this period the placebo given for one week afforded no relief after each session.

TABLE I.
CHRONIC MUSCULOSKELETAL CONDITIONS TREATED WITH TOPICAL ANALGESIC (T. A.)

Case	Clinical Data and Diagnosis	Previous Treatment (No Benefit)	Treatment with T. A.	Results with T. A.
1	Pain in knees — osteoarthritis.	Infrared, massage.	Same using T. A.	Complete relief of pain in knees after 2 treatments.
2	Low back pain — rheumatoid arthritis.	Heat, liniment* for many treatments.	Heat, massage with T. A.	Relief for 3-4 hrs. each time.
3	Painful arm following CVA, contractures of elbow and shoulder.	Heat, massage, passive exercises.	Same using T. A.	After each treatment painless passive stretching possible; increase of range of motion by 45° in shoulder, 15° in elbow. Temporary relief of pain.
4	Painful neck and shoulders — osteoarthritis, fibrositis.	Heat, liniment,* massage, exercises.	Same using T. A. 4 times.	Complete relief of shoulder pain.
5	Pain in arm and shoulder — brain tumor, post-op. hemiparesis.	Heat, massage.	Same using T. A.	No response.
6	Painful shoulder — CVA; frozen shoulder.	Massage, exercises.	Same with T. A.	After each application, pain reduced to tolerable limits for 10-15 hrs.
7	Pain in hip and knee — CVA.	Liniments,* massage, exercises.	Massage with T. A., exercises.	No pain for 15 hrs. after treatment.
8	Painful shoulder — CVA.	Massage, heat.	Same using T. A.	Relief for 4 hrs. each time.
9	Painful leg — heel injury followed by triple arthrodesis.	Hot packs, massage.	Radiant heat, massage with T. A.	Temporary relief for 4 hrs. each time.
10	Low back pain — previous lumbar spine fusion.	Moist heat, massage.	Same using T. A.	Relief for 6-8 hrs. each time.
11	Pain in neck and shoulders — osteoarthritis, CVA.	Massage.	Massage with T. A.	Relief up to 15 hrs. after treatment.
12	Phantom pain . . . above-knee amputation.	Massage and stump exercises.	Same with T. A.	No improvement.
13	Pain over right clavicle and low-back — healed fracture of clavicle; low back syndrome.	Both areas treated with moist heat, massage.	Same with T. A.	Relief in both areas for 24 hrs. after treatment.
14	Ruptured supraspinatus tendon — 2 mos. painful shoulder.	Infrared, massage, exercises.	Same with T. A.	No relief of pain.
15	Low back pain . . . Herniated disc, radiculitis.	Used liniments*, heat at home.	Heat, massage with T. A.	Could sleep at night as relief from pain lasted 8 hrs. after treatment.
16	Painful frozen shoulder — rotator cuff tendonitis.	Home remedies of heat, liniments*	Heat, massage with T. A.	Relief of pain for 6 hrs. after treatment.
17	Low back pain — radiculitis unrelieved by laminectomy.	Short wave, massage; liniments* at home.	Heat, massage with T. A.	No relief.
18	Low back pain . . . disc disease, laminectomy.	Heat, massage.	Same using T. A.	Pain relieved for 8 hrs. after treatment.
19	Fibromyositis of thigh, tenderness, "frozen skin" sign.	Heat, massage.	Same with T. A.	Tenderness relieved for 6 hrs. after treatment.
23	Painful and frozen shoulder . . . rotator cuff tendonitis.	50 treatments, heat, massage, exercises.	Same using T. A. 4 times.	Shoulder motion improved from 75% to 100%, except int. rot.; pain only at limits of motion.
24	Painful frozen shoulder, 2 mos. — rotator cuff tendonitis.	Heat, massage.	Heat, massage with T. A., exercises.	Pain only in motion after 6 treatments. Abd. from 90° to 160°; flex., from 90° to 120°; ext. rot. from 10° to N; int. rot., from 40° to N.
26	Incapacitating attacks of pain in rt. hip and glutei . . . diagnosis unknown; x-ray: radio-opaque material in buttock.	Heat, massage for several wks. with temporary relief.	Heat, massage with T. A., 6 times in 2 wks.	Marked relief of pain after one treatment; complete relief in 2 wks.
34	Pain and limitation of trunk motion . . . myositis of erector spinae *T* spine.	Heat, massage for 3 mos.	Massage with T. A., exercise 9 times.	Pain in *T* region at extreme trunk flexion and extension.
35	Low back pain, recurrent, 50% limited *L* spine flexion, walking painful . . . osteoarthritis by x-ray.	Heat, massage for each attack.	Massage with T. A., mobilizing exercises 8 times.	Walking painless, *L* spine motion 25% of normal; previous attacks lasted 2 mos. or more, this attack alleviated in 1 mo.
36	Low back pain, 50% limited *L* spine motion; no neurological signs. Duration 1 mo.	Short wave, massage in latter 2 wks.	Massage with T. A., exercises, 8 times.	Relief from pain for 2-3 hrs. after treatment. In 1 mo. *L* spine motion 25% of normal; less discomfort walking and bending.
37	Pain, limitation, stiffness in both knees . . . osteoarthritis.	Heat.	Massage with T. A., mobilizing exercises 4 times.	No pain, less discomfort in walking for 2 hrs. after treatment.

*chloroform liniment, methylsalicylate

TABLE II.
ACUTE MUSCULOSKELETAL CONDITIONS TREATED WITH TOPICAL ANALGESIC (T. A.)

Case	Clinical Data and Diagnosis	Previous Treatment (No Benefit)	Treatment with T. A.	Results with T. A.
20	Low back pain 10 d. after onset of acute infection. 50% limitation of *L* spine mobility, tenderness.	10 d. of S.W.	Massage with T. A., mild exercises 10 times; daily.	Only mild back discomfort; *L* spine mobility almost normal. Relief of pain began in 1-2 treatments.
21	Fullness, tenderness of left gastroc., limp, could not stand on toes . . . tear of gastroc., 24 hrs. duration.	none.	Massage with T. A., 4 days.	In 48 hrs. slight limp, walks on toes; asymptomatic in 4 d.
22	Pain, fullness, tenderness under left clavicle; painful arm, neck motions . . . tear of pectoralis minor, 48 hrs. duration.	none.	Massage with T. A. once.	Refused further treatment; 80% less pain at rest, with activity.
25	Painful neck, left arm motions, excused from work . . . myositis of trapezius, duration 2 d.	none.	Massage with T. A., exercises 5 times.	Returned to work after treatments; normal joint range after 2nd wk., no pain.
27	Pain, limited neck, trunk motions, tenderness over left shoulder . . . myositis of trapezius, duration 8 d.	Heat, massage 3 times.	Massage with T. A., exercises 6 times.	Marked relief of pain after treatment; after 6, full range of *C* and *T* spine mobility, no pain.
28	Painful motion of right arm . . . costoscapular syndrome.	Twice with heat, massage . . . "getting worse."	8 times massage with T. A., postural exercises.	Complete relief of pain.
29	Pain-limited motion of left wrist . . . sprain, 3 d. duration.	Hot soaks for 3 d.	Massage with T. A. and exercises for 4 d.	Each day less pain, more motion; discharged after 4 d.
30	Painful, stiff neck . . . acute myositis of trapezius, acute onset 7 d. previously.	Short wave and massage during 1st week.	Massage with T. A. and exercises for 2 d.	Surprising decrease in pain and gain in motion after 1st Rx. Full range of neck motion with slight pain after 2nd Rx.
31	Low back pain, tenderness, 75% limitation of motion of *L* spine, no neurological signs . . . acute sprain, 1 wk. duration.	Twice ethyl chloride spray; 4 times, short wave; then back strapped because of pain.	Strapping removed; daily massage with T. A., mild mobolizing exercises t.i.w. for 2 wks.	After 2 treatments marked relief of pain. After 2 wks. minor discomfort, motion 80% of normal; at this time trunk strengthening exercises were possible in absence of pain.
32	Pain, swelling, tenderness, 80% limited motion of ankle jt. . . . acute sprain (neg. x-ray), duration 4 d.	Immobilization by elastic bandage, rest.	Bandage removed; massage with T. A., mobilizing exercises daily for 1 wk.	Bore weight after one treatment; after 4, motion 75% of normal. In 1 wk. full motion, slight pain in walking.
33	Pain, frozen right shoulder . . . acute rotator-cuff tendonitis, duration 2 wks.	Short wave, exercises; pain precluded exercises.	Massage with T. A., exercises t.i.w. for 2 wks.	Minor pain with exercises after 1 wk. In 2 wks. abd., 50° to 140°; flex., 80° to 160°; ext. and int. rotation, 40° to 70°; slight painful motion.

Case 41: Osteoarthritis of the left knee for 25 years. Severe pain with stair-climbing and pain on knee flexion beyond 120°. In the past the patient had received heat of all kinds, massage, exercises with little or no relief. For the first time, physical therapy gave some benefit when massage was used with topical analgesic followed by mild mobilizing exercises for stiffness. After each session pain disappeared for one to three hours. The patient was treated in this manner for one month. During one week of treatment the placebo was used with massage and the temporary relief failed to ensue.

These four cases further documented the efficacy of a topical analgesic in relieving pain. These four instances represented chronic conditions in which no hope of reversibility of the process could be envisaged. Yet relief of pain, although temporary, ensued. Its efficacy contrasted with the absence of benefit following a placebo preparation used without the patient's knowledge. Since the placebo contained methylsalicylate, the results also indicated the superiority of the topical analgesic over this substance, which is a common ingredient in liniments.

Summary

Painful areas in acute and chronic musculoskeletal affections were massaged with an analgesic substance in an oily base, on the hypothesis that percutaneous absorption may alleviate pain.

Forty-one patients, 11 with acute and 30 with chronic conditions, were so treated along with exercises following a course of ineffective physical therapy which included massage and standard liniments in some instances.

The majority with chronic disease enjoyed temporary relief (one to 24 hours); some even had complete relief. In all a satisfactory effect was obtained in 85%.

All the acute patients report satisfactory subsidence of pain and improvement of function within two to 14 days.

Results derived from a blind-test procedure in four patients with long-standing pain substantiated the opinion that the preparation is an effective analgesic. As a surface analgesic it enhances the usefulness of massage by reducing pain, thus permitting functional exercises otherwise impossible to administer. In no instance was dermatitis or other side effects noted.

MOSCOW MEDICINE

● ROBERT M. HOSLER, M.D., F.A.C.S.
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For scientific as well as political reasons, no one can afford to ignore the recent dramatic developments in Soviet medical research.

Ten days in Moscow does not make one an authority on Russia, but I would like to report some of my personal impressions and opinions formed during a recent visit to the Soviet Union. I was fortunate in receiving a cordial invitation from Professor V. A. Negovsky to visit his country. Our first two days seemed like an adventure to my wife and me, as we did not request a guide interpreter. After the second day it became apparent that our independent arrangement, owing to the tremendous language barrier, would be impractical. Furthermore, this service is already paid for before one enters the country. As our visit wore on we became more bewildered. I understand that our feeling was not unique, and that it becomes more pronounced if one stays two months to a year or more.

We met two types of people; those youngsters of the Russian Government's Tourist Agency, whose psychological approach is parallel to and follows that of its government, were one type. We were familiar with this from reading our newspapers and following the proceedings of the United Nations, but a heavy dose of chauvinism becomes rather frustrating. The second type were the doctors and scientists, who were cooperative, outgiving and exceedingly cordial. They politely stayed away from discussion of political subjects.

These scientists impressed us as intelligent, serious and dedicated scholars, with a great desire to share their knowledge with us; even suggesting a world medical conference on resuscitation. The groundwork already is being laid as it meets with approval in our national capital.

Their medical schools are graduating about 15,000 physicians a year. Almost 70% of these are women. During Czarist times about 5% of the profession consisted of women. There are no idle women in Russia. They seem to be needed in all the professions. It is said that there are 14 million more women than men in the Soviet Union.

In medical education, as in engineering, great stress is being placed upon the basic sciences, for it is deeply felt that progress can originate only from a firm groundwork in these fundamentals. With this philosophy as a background, and extreme academic freedom in certain designated fields, the rate of progress in medicine and science has been phenomenal during the past 10 years. The Russians openly indicate that within the next seven to 10 years they definitely expect to surpass us. (They naturally are depending upon us to remain complacent and be more interested in our individual standard of living than in research.)

The curtain began to unfold after a reception given for us by the Minister of Health for the Federated States of Russia. In his spacious office we were invited to sit at a large refectory table covered with delicacies and decanters. A toast at 10 o'clock in the morning was a real innovation for me. Dr. Kurashov asked me to name the things I wanted to see. As a result I visited everything that I requested. Also present at this reception, that quickly consumed three hours, were my wife, Professors Blohkin and Negovsky of the Institutes of Cancer Research and Resuscitation respectively, and two interpreters.

That afternoon and part of another day were spent at the Institute of Resuscitation. Here there are 50 doctors constantly working on research problems and temporarily attached doctors who later go out to Soviet hospitals to teach resuscitation techniques. Well organized teams are found in every hospital. An abstract of *A Manual on Cardiac Resuscitation** has been sent to every single hospital in the Soviet Union, by order of the Minister of Health.

On short notice, about 125 doctors were rounded up and I was asked to address them in the auditorium of the institute. This I did with

*R. M. HOSLER: *Manual on Cardiac Resuscitation*, 2nd ed. published by C. C. Thomas.

a splendid interpreter who had been born and raised in Shanghai where he had also received his medical education. After World War II he was repatriated back to Russia. I survived a question and answer period much better than I had anticipated. Hanging above the podium directly over my head was a large picture of Karl Marx.

Interspersed between medical talks and visits to various hospitals, institutes and clinics were some ordinary sight-seeing trips which were of great interest. Moscow now has seven million people. Its main streets are much wider than Park Avenue and they are kept scrupulously clean by a crew of women who sweep them with primitive twig brooms 24 hours a day. We were told that this capital would soon be the largest and most beautiful city in the world. At present there is a tremendous, all-out building boom.

An automobile trip to visit the Fortress Monastery at Zagorsk was absorbing. It is about 50 or 60 miles northeast of Moscow. Much of Russian history was written here as the Mongols and Tartars were turned back at this point. Much to our surprise we found a functioning theological seminary there.

A full day was spent at the Skilifassovsky Hospital where, standing beside the operating tables, we witnessed several types of major surgery. At first I was stunned to see some of the patients walk to the operating room in their own socks without premedication and climb onto the table unassisted and then receive a spinal anesthetic. One operation consisted of a gastrectomy for carcinoma of the antrum of the stomach. An excellent operation was carried out by Dr. Androsov with their time saving instruments. From the incision to sewing up the abdominal fascia consumed exactly 30 minutes.

This hospital is famous for its cadaver blood bank. In the small world department, Elliot Cutler, my mentor, visited this institution after V-E day in 1945. They recalled him well and remembered him as very helpful. At this one institution they have already processed over 30 tons of blood. We witnessed the withdrawal of eight pints of blood, under sterile conditions, from a man who had recently dropped dead on the street. There is no need to citrate the blood. It can be stored for six weeks. Can an eye bank be considered in the same category?

Dr. Pavel Androsov and his assistant then demonstrated on human tissue many of their time saving instruments. All of these new developments have a direct application to military and disaster medicine. I have their book (1957) the title of which is, *New Surgical Apparatus and Instruments with Their Uses.* With these instruments, the technical problem of organ transplantation is limitless and is well on its way to being solved. Among other things, it would not surprise me to have them announce at anytime that they had successfully exchanged hearts in two dogs in record time.*

The most remarkable instrument that was demonstrated to me was for rapid suturing and anastomosing blood vessels. It applies a circular mechanical suture by means of small tantalum staplers. The intima is turned out and the clamps do not protude into the lumen, neither do they crush nor devitalize the tissue. A few of its applications are treatment of traumatic vascular lesions, aneurysms, transplantation of organs and reconstructive surgery.

A double hinged, large jawed instrument is used to resect the stomach and quickly close the

*This has since been announced in European newspapers. Time: 30 minutes.

Figure 1
Institute for the Development of New Surgical Instruments, Moscow. Here, 200 people are employed solely at research on surgical instruments.

open end with a double layer of buried tantalum clamps. Another instrument for securing the hilus of the lung was demonstrated on human tissue. It was stated that a pneumonectomy could be done in 10 minutes with this instrument.

There is an Institute for the Development of New Surgical Instruments. It is a six story building (Figure 1) in which about 200 people are employed solely for this one purpose.

About 3:30 in the afternoon we visited Dr. Tarasov's office. He is the Medical Director of the Skilifassovsky Hospital. In his suite was found the inevitable table piled high with delicacies and this time two full quarts of Scotch. Dr. Androsov, the Chief Surgeon, joined us. We learned that about 50% of the doctors in this institution were women. Each doctor works five hours a day and twice a month he is on duty for a 24 hour period. This particular hospital takes care of all emergencies in Moscow. During 1957, there were 1,999 ectopic pregnancies operated upon here.

Professor Negovsky gave a dinner party for 14 at his town residence. He lives alone in an apartment. There were four women physicians present and one interpreter other than Dr. Smolnikoff who spoke English fluently. I will not go into detail other than to remark that this, too, was a most fabulous experience.

We spent another day at the Thoracic Institute where Dr. Smolnikoff is the director of anesthesia. During the course of one heart operation I had the opportunity of seeing the standby resuscitation team go into action following a hemorrhage. The circulation was successfully maintained. There was excellent coordination and cooperation in their up-to-date operating rooms.

In talking to the Deputy Director of this hospital I found that his salary was 7,000 rubles a month; while his rent was 200 rubles. The maximum income tax is 6%.

Our hotel was the National, situated across the street from the Kremlin. No doubt it is considered very fine, but it represents Victorian elegance. Our suite was monstrous and contained a concert grand piano. My wife played it the first day, but thereafter found that she could not play with her gloves on. There was no heat in the hotel in spite of the fact the temperature reached 32° every morning in mid-September. Our neighbor was Mrs. Eleanor Roosevelt.

At six, of the morning we left, Professor Negovsky showed up at the distant airport to bid us goodby. We were never asked to open our baggage upon entering or departing on their jet Tu 104.

In summary I will say that Russia is a country of extreme contrasts in all fields, as well as in medicine. I cannot recommend it solely as a vacation spot. The world seemed much brighter upon reaching the friendly city of Copenhagen in just two hours.

Better Than One?

Russian medical scientists, in research designed to lead to the transplanting of human limbs, have successfully transplanted both hearts and heads in experiments with dogs.

Dr. A. David Gurewitsch, Associate Professor at the College of Physicians and Surgeons at the Columbia Presbyterian Medical Center, observed the operations in Moscow last September, "Nobody can underestimate what the Russians are doing. Their technical accomplishment is very considerable." Dr. Gurewitsch said the entire Russian success "is based essentially on a gadget, an operative tool, which permits surgeons to staple one blood vessel to another with one movement."

Time is of the essence in such surgery, and the instrument developed by the Russians does in 30 seconds what it would normally take a surgeon 30 minutes to do — that is, the linking of one blood vessel to another.

The Russians have granted a license for the commercial production of this instrument in the U. S. — but it is not known when it will be made available to American surgeons. There is nothing like it in the United States today.

The transplanting of hearts is more difficult than the transplanting of heads because there are so many big vessels that have to be tied. The human brain is dead if it does not have a supply of blood for 10 minutes. The cells die forever. But a human limb, for instance, an arm or leg, will live for 100 hours after death without the cells dying.

Therefore, theoretically, it should be possible to take a human leg from a dead person and give it to someone who needs a leg instead of a wooden leg. This sort of thing is the ultimate objective of this kind of surgery.

The Russian accomplishment was reported in a broadcast by Radio Moscow. The broadcast said Vladimer Demikhov had successfully added a puppy's head to an Alsatian dog 16 days ago and both the dog and the extra head are doing well. In similar operations previously, the Moscow Radio said, the dogs had not lived for more than six days.

The dog, the radio said, is named Pirat. It added: "Pirat is feeling well and full of life, as a Tass correspondent could see when Demikhov showed him the dog Friday. Pirat goes out and eats meat with relish. The second head reacts vividly to everything around it. It does not need separate feeding since Pirat's stomach now serves the dog itself and the puppy's head. However, the head laps water. It retains its ability to move, which shows that the nerves are intact and the brain is functioning normally."

—*Miami* (Florida) *Herald*, April 12, 1959.

Ceremony for Professors Emeriti Harvard School of Public Health

Harvard University recently completed its 44th year of graduate instruction in public health and the Faculty of Public Health its 37th year of activity since its establishment as a separate School.

In order to show the appreciation of the School to distinguished faculty members, a brief ceremony was observed in their honor. Among the members of the Professors Emeriti of the Harvard School of Public Health so honored was Alice Hamilton, M.D., A.M. (hon.), S.D. (hon.), pioneer practitioner of industrial medicine. The short address was spoken by Philip Drinker, Ph.D., Professor of Industrial Hygiene, Harvard School of Public Health.

In the year 1919, industrial medicine in the United States was just beginning to emerge into scientific respectability. In that year Harvard, through Dean Edsall of the Medical School, offered Dr. Alice Hamilton the post of Assistant Professor of Industrial Medicine. It was our good fortune that she accepted and held the position in the Medical School and then in the School of Public Health until her retirement in 1935.

This University knew that she was the leader in her field. That she was the first woman to be made a professor at Harvard made the job additionally challenging and probably favored us and her acceptance — for she never has been able to resist a really good challenge.

She helped start the JOURNAL OF INDUSTRIAL HYGIENE and remained in active editorial capacity until her retirement. Her guidance, her thorough appreciation of good writing and her extraordinary knowledge of the dangerous trades helped immeasurably in the early years of this

Doctor Alice Hamilton receiving Harvard School of Public Health Coat of Arms from Professor Drinker. From left to right: Dr. Lee, Dr. Hamilton, Dr. Tyzzer, Prof. Wilson and Prof. Drinker.

new journal, the first of its kind in the English speaking world.

She always had a deep interest in the problems of the worker. She respected the dignity of work and of common labor. Her years at Hull House, with Miss Jane Addams, make a chapter in her career that helps explain her sympathetic understanding of the workers' health problems.

Before she came to us, she had unusual experience in investigating and reporting upon the dangerous trades. Her publications and process descriptions are a model of photographic accuracy, always well written, never verbose, and interspersed nicely with case reports from her own experience. They are never dull. Some of the improvements she advocated have been achieved and others are well on the way. She had much to do with the elimination of phosphorus in matches, with reduction of lead poisoning in the metallurgy and uses of lead, and with poisoning by mercury, by benzol, TNT, carbon disulfide, and carbon monoxide.

A sentence in her *Industrial Toxicology* has become an epigram in industrial hygiene. . . . "It must never be forgotten that the great majority of industrial poisons enter the body with the inspired air and that while a workman eats only three times a day, he breathes sixteen times a minute during the eight or ten hours of his working day."

She had an amazing ability to meet with a hostile management of a plant — I have been with her at such a meeting and seen the hostility descend to downright rudeness, then gradually change to friendliness, and end with a very complete disclosure of secret processes by management. Then she would assure management that her report would be strongly critical of certain things but the episode was generally characterized — not always — with management's assurance that they would like to see the report and to comply with her suggestions. In this fashion she did industry great service and won respect and affection from many employers and employees. Both knew her to be fearless and scrupulously fair.

Dr. Hamilton, we, your colleagues at Harvard, know that the health of the worker has been vastly improved because you devoted most of your professional career to the field of occupational health. On behalf of our Faculty, I have the honor to present to you the coat of arms of the School and a statement of our deep appreciation.

—PHILIP DRINKER
Professor of Industrial Hygiene

Doubly Honored

Alice Hamilton, M.D., a founder of the profession of occupational medicine, was honored on her 90th birthday (February 27) by the establishment of a fund bearing her name at the Harvard School of Public Health.

Dr. John C. Snyder, Dean of the Harvard School of Public Health, said the Alice Hamilton Fund for Occupational Medicine was made possible by contributions from friends, admirers, former colleagues and students of Dr. Hamilton in observance of her 90th birthday. "In response to this spontaneous and generous gesture, the Faculty of Public Health is proud to create a named Fund for purposes in keeping with Dr. Hamilton's lifelong interests and high achievement in the field of occupational medicine," Dr. Snyder said. "These purposes will include scholarship aid and honoraria for lecturers. The School hopes eventually to establish an endowed Chair in Occupational Medicine."

In the early days of the Twentieth Century, Dr. Hamilton, then associated with Jane Addams at the Hull House in Chicago, with determination and persistence brought home the facts on industrial poisons to manufacturers, first in Illinois and later in the nation. It was largely through her efforts that Illinois became the first state in the Union to adopt legislation in the field of industrial health. Nationally, she was instrumental in bringing about legislation eliminating phosphorus from matches, the reduction of lead poisoning in metallurgy, and with poisoning caused by mercury, benzol, TNT, carbon disulfide and carbon monoxide.

In 1910, when the State of Illinois started the first comprehensive survey of occupational disease, Dr. Hamilton became the survey's director. She continued in her work at the Hull House until 1919 when she joined the Faculty of Medicine at Harvard as assistant professor of industrial medicine.

In retirement she also conducted two surveys for the Federal government, the first in 1937 into the health hazards of the rayon industry, and the second in 1940 into diseases such as silicosis, common to miners. She is the holder of many honorary degrees.

The American Medical Women's Association, of Boston, honored Dr. Hamilton in 1956 by naming her Medical Woman of the Year.

THE PERIODIC HEALTH EXAMINATION In Preventive Medicine

• E. L. CRUMPACKER, M.D.
and
• JAMES P. BAKER, M.D.

The Greenbrier Clinic
White Sulphur Springs
West Virginia

The periodic health examination is the most effective and economical technique of applying present knowledge to the prevention of disease – the ultimate goal of medicine.

"The superior physician helps before the early budding of disease. The inferior physician begins to help when the disease has already developed. Hence, the sages did not treat those who were ill; *they instructed those who were not yet ill.*" (Italics ours). Thus wrote the Yellow Emperor in 2,697 B. C.[1]

The ultimate goal of medicine is to prevent disease. From the dawn of history this constant star has guided the groping efforts of reflective physicians. This is one of the oldest recorded medical concepts. Yet, it is frequently lost sight of in our often feeble and sometimes frantic attempts to cure disease. Though the goal, prevention of disease, has remained constant through the centuries, there has been a continuing evolution of emphasis and methods. It is the purpose of this paper to inquire into the relation of the periodic health examination and the present concept of preventive medicine.

The Evolving Concept of Preventive Medicine

Until modern times, prevention of disease was largely empirical. The amulet, the talisman, the ritual, curious and colorful primitive attempts at preventive medicine, were born of ignorance and superstition. But few know how surprisingly modern and effective were some of the empirical methods of ancient civilizations. The strictly enforced Egyptian laws pertaining to boiling drinking water, meat inspection and personal cleanliness constitute a high order of hygiene.[2]

The first instances of specific disease prevention, albeit still somewhat empirical, occurred in relatively modern times. In the eighteenth century there were two discoveries which revolutionized the entire concept of preventive medicine. With the famous treatise of James Lind on scurvy in 1753 and Edward Jenner's definite work on smallpox in 1796, a new era was born. Here was positive proof that specific diseases could be prevented by specific measures. Further significant advance had to await the golden age of microbiology which began with Pasteur and Koch.

For nearly three quarters of a century, preventive medicine orbited around infectious disease control. Indeed, by many the terms are considered to be synonymous. This predominating emphasis was entirely justifiable. At the turn of the century, pneumonia was still "Captain of the men of death," and tuberculosis was his senior lieutenant. These two diseases alone had a mortality rate nearly half as large as the current rate from all causes. Control of infectious diseases by sanitation, hygiene, vaccines, antitoxins, chemotherapy and antibiotics has been largely responsible for increasing the life expectancy at birth from 49.2 years in 1900 to 69.6 years in 1956.[3]

This phenomenal progress against the infectious diseases has drastically altered the vital statistics of our population. In 1955, 826,890 Americans died of cardiovascular-renal disease. This was 54% of all deaths. It was 19 times as many as died of pneumonia and 53 times as many as died of tuberculosis. Since 93% of all cardiovascular-renal disease results from hypertension and atherosclerosis, currently, nearly half of all Americans who die succumb to these two diseases. Cancer has advanced in rank from eighth to second place since 1900 and now accounts for one death in six.[4]

It is not suggested that the infectious diseases

have been finally conquered. Indeed, it seems apparent that they will continue to harass mankind indefinitely. It is equally clear, however, that they no longer constitute the major health hazard. Hippocrates has stated that "One should know to what diseases nature most inclines." There can be no question that today the American people most incline to the degenerative, neoplastic and metabolic diseases. Logically, then, our maximum efforts in preventive medicine should incline in the same direction.

As long ago as 1904, in the very midst of the early triumphs over infectious diseases, Biggs, a far seeing public health authority, recognized the possibilities of a broadened concept of preventive medicine. He wrote, "In the broad sense, preventive medicine comprises both general prophylaxis and individual prophylaxis, and applies to all forms of disease not simply to infectious diseases."[5]

Today preventive medicine is in a period of transition. During the past two decades the predominant emphasis has been rapidly shifting to a search for ways and means of preventing degenerative, neoplastic and infectious diseases. This is confirmed by a study of public and private grants as well as by the increasing number of workers in these fields of research. The National Institute of Health is a monument to the evolving concept of preventive medicine.

Although the emphasis is rapidly changing, preventive medicine today still has no specific weapons against the degenerative, neoplastic and metabolic diseases comparable to those which have proved so effective against infectious diseases. Expectantly we watch the efforts of our colleagues in research, hoping that one day they may tell us how to prevent atherosclerosis and cancer as surely as we prevent smallpox and poliomyelitis today. Meantime, in this transition period, while awaiting specific preventive measures, we as clinicians are charged with the responsibility of saving as many lives as possible by the application of present knowledge, empirical and incomplete though much of it may be.

The Role of the Periodic Health Examination in the Present Transitional Concept of Preventive Medicine

In this period of transition which began with the changing emphasis in preventive medicine and which will continue until the discovery of specific measures against the degenerative, neoplastic and metabolic diseases, the periodic health examination can and should play two important roles, (1) application of knowledge already obtained and (2) supplementation of basic research.

Some Examples of the Application of Present Knowledge: Except for a few occupational carcinomas there is no known way to prevent cancer. Yet, as emphasized by the American Cancer Society, application of present knowledge can prevent the ravages of this dread disease in a great many patients. It is estimated that 75,000 Americans will die of cancer in 1958 who could have been saved by practicing what is already known about cancer.[6]

In some tumor registries cancer of the rectum and colon is the most frequent cancer. Only about 25% of the patients with rectal cancer are now being saved.[6] Yet, death from cancer of these organs can be largely prevented with the knowledge already at hand.

At the Greenbrier Clinic through June 30, 1958, we have performed 12,778 examinations on 5,813 patients. Polyps of the rectum and colon have been discovered in 354 (6.1%). Three hundred and forty-three of these had polyps within reach of the sigmoidoscope. Forty-two had polyps at a higher level as demonstrated by double contrast barium enema examinations. Thirty-one had polyps both within reach of the sigmoidoscope and also at a higher level. Eleven had polyps only at a higher level.

Most authorities agree that rectal and colonic polyps are premalignant. Indeed, a slogan of the American Cancer Society is, "Polyp detection is cancer prevention." A small minority disagrees that large bowel adenomas are premalignant. We believe that the evidence is overwhelmingly in favor of adenomatous polyps being potentially dangerous and that many lives can be saved by the removal of benign adenomas. However, even were we to accept the other view, the number of polyps which were already malignant is quite significant.

Thirty-five polyps (10%) contained either early invasive carcinoma or carcinoma in situ. There was one carcinoid, and, surprisingly, five cases of asymptomatic and unexpected multiple polyposis. That the latter were potentially malignant conditions, there can be no question. Of these 41 patients with malignant or unquestionably premalignant lesions, the evidence suggests that all but one were found early enough to be permanently cured. One was probably found sufficiently early, but a two year delay in treatment has resulted in metastases. Applying the average death rate for this type of cancer, 30 of our patients would have died of their disease.

The incidence of carcinoma in situ in our series of polyps is probably higher than the figures suggest for three reasons. Many proctologists fulgurate polyps without biopsy, in about a third of the cases we did not receive a pathological report and, finally, there is no

uniformity among pathologists as to what constitutes carcinoma in situ. What some pathologists refer to as "atypical" or "active" polyps, others will call carcinoma in situ.

Examination of cervical smears by the Papanicolaou technique is of proved value in screening women for uterine cancer. This is routine at the Greenbrier Clinic. Of the 1,762 women examined, five had proved carcinoma of the cervix, three in stage 0 and two in stage one. Five others have had suspicious smears which have thus far not been confirmed by further study but are still under observation.

In our experience the present methods for the early detection of gastric and bronchogenic carcinoma are inadequate as compared to the techniques for early detection of cancer of the colon and cervix. Posteroanterior and lateral chest films and barium meal studies have enabled us to save very few people from fatal cancer of these organs. Urgently needed are new screening techniques for the early detection of these neoplasms. The diagnex test may prove helpful in the future. Much work is being done in this field and we are hopeful that accurate and practical new methods will be developed.

There have been 872 patients with hypertensive vascular disease, an incidence of 15%. The course of this major killer can now be altered in a great many cases by the application of present knowledge.[7] Between 1952, when the rauwolfia derivatives and other antihypertensives began to be widely used, and 1955, the latest date for which figures are available, the national death rate for hypertensive cardiovascular disease declined 18%.[4] There is every reason to believe that better application of present knowledge could prevent a much larger number of deaths from this cause.

A double Master's two-step exercise test has been performed routinely on the 4,051 men examined. Using Master's original criteria, 909 have had positive tests on one or more examinations. We have avoided making a positive diagnosis of coronary heart disease on this basis and the routine testing has been primarily for the purposes of investigation. These data will be analyzed in a later study. Our preliminary impression is that the test may have value as a screening technique but only if the recently advocated more rigid criteria are used.[8] When the more stringent criteria are employed, the number of positive tests is only a fraction of the above figure.

In our patient population there are 228 diabetics, an incidence of 3.9%. More than half have been detected at the Clinic. We believe that in the future our find will be even higher since we have adopted as a routine the determination of the blood sugar by the Somogyi-Nelson method two hours after the ingestion of 100 gm of glucose.

In 239 (4.1%) of our patients cholelithiasis has been demonstrated. In over 200 the diagnosis was first made by us.

These are only a few examples to illustrate the usefulness of certain screening techniques in the application of current knowledge of disease prevention. Space does not here permit an analysis of the many hundreds of diagnoses of other significant disorders of this group of patients.

Occasionally someone questions the value of the periodic health examination, usually someone who has had no experience in the field. However, few would question the usefulness of certain screening techniques, i.e., systems history review, physical examination, chest x-ray, electrocardiogram, proctosigmoidoscopy, examination of the stool for occult blood, cervical smear cytological examination, hemoglobin determination and post oral glucose blood sugar determination. Is there a more convenient or economical way to bring all of these techniques together, to apply present knowledge, than by the comprehensive periodic health examination?

Most reports of periodic health examinations emphasize those disorders in which the diagnosis and therapy are easily tabulated,[9] as does this one. That is only natural since such facts and figures unequivocally document the value of the procedure. Yet, it is probable that physicians engaged in this work would unanimously agree that the most valuable facet of the technique is much less tangible and does not lend itself to quantitation. To paraphrase the Yellow Emperor, it is "the *instruction* of those who are not yet ill." We believe that health counseling is the most valuable, the most satisfying and most truly preventive aspect of the endeavor.

Let us take, for example, the man 45 years old who is 25% overweight, smokes two and one-half packages of cigarettes daily, is chronically fatigued and has an initial blood pressure of 160 systolic and 100 diastolic which falls to 140 systolic and 90 diastolic on rest. His two-step exercise test is positive and his serum cholesterol is 300 mg%. Not one positive diagnosis of organic disease can be made from these data. Yet, what physician can escape the conviction that, though perhaps not imminent, this patient is headed for serious trouble. Now suppose a conscientious doctor spends all the time necessary in a frank "hard sell" to instill into his patient the determination to conserve his physical resources. An easily followed, reasonably low fat, low salt diet is outlined. Calories are reduced sufficiently to gradually bring the weight into the normal range. Smoking is re-

duced to one package daily. Adequate time for rest and relaxation is budgeted. If the original "sell" and the periodic friendly follow-up notes of encouragement are successful, it is not unusual to have the patient return with his weight in the normal range, the blood pressure 125 systolic and 80 diastolic, the two-step test negative and the serum cholesterol lower. Who can quantitate the effect of counseling on the health of this individual? Yet, he feels and appears a great deal more healthy.

With the aid of the United States Public Health Service, we at the Greenbrier Clinic are presently engaged in a statistical research program which we believe will, in a few years, aid in the quantitation of the impact of various aspects of the periodic health examination on morbidity and mortality.

The Role of the Periodic Health Examination in Research: Physicians conducting these examinations are in a position to perform interesting and useful clinical research.[10] However, we believe that an even greater contribution can be made by cooperation with those in the basic sciences, i.e., the biochemists, the biophysicists and the biostatisticians.

When patients seek the help of a doctor or clinic because of symptomatic illness, there is an element of preselection which makes them unsuitable for many types of research. At the Greenbrier Clinic we have a cross section of patients almost free of selection. Further, most of our patients return year after year. Nearly all can be followed with only negligible loss to follow-up. This combination of absence of selection, completeness of follow-up and comprehensive clinical data for future correlation provides an ideal situation for long range biochemical and biophysical investigation of the degenerative and metabolic diseases. We have initiated such a program and hope to expand it. All who engage in this type of work have an opportunity and an obligation to cooperate with the research efforts of those in the basic sciences.

Philosophy of the Period Health Examination

All preventive medicine requires some reorientation of philosophy on the part of those who practice it. Doctors are trained primarily to diagnose and treat sick people, not to prevent illness. This has been emphasized by Pepper.[11] Further, preventive medicine does not possess the spectacular nature of acute illness therapy. Compared to the excitement and drama of the treatment of bulbar poliomyelitis with tracheotomy and respirator, giving vaccine to school children is rather dull. Compared to the management of the patient with obstructing carcinoma of the colon, the detection and removal through the sigmoidoscope of an asymptomatic polyp containing carcinoma in situ is a colorless procedure. Today, the doctor's image of himself and society's image of the doctor is almost invariably of one who treats illness. This being so, it takes considerable mature and objective reflection to reorient one's philosophy to the point that adequate personal satisfaction can be obtained from preventive medicine. Yet, if saving life is truly our goal, there can really be no question concerning the relative importance of the two approaches.

Summary

The ultimate goal of medicine is to prevent disease. So much progress has been made in preventing infectious diseases that preventive medicine is currently undergoing a realignment of emphasis. The degenerative neoplastic and metabolic diseases now constitute the greatest health hazards. Until specific measures to control these diseases are discovered, the periodic health examination is the most effective and economical technique of applying present knowledge to the prevention of the ravages of these diseases. Basic research should be a part of periodic health examination programs.

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Psychological Aspects of Accident Causation

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The story goes that when any of Freud's children, having sustained a cut or a bruise, came to him for sympathy, he was inclined to ask, "Why did you do it?" While such a direct approach would probably be frowned on by the currently popular child-care experts, there is little question in my mind that the investigation of psychological, or feeling states, for the period of a few days, hours, minutes or seconds preceding an accident would consistently bring to light fascinating data on the psychological determinants of accidents.

To put the problem in perspective, all of you remember the good old safety aphorism, "Accidents just don't happen. They're caused." This was and remains an excellent way of reminding people that an accident is not an unwanted event that we simply can't avoid; it is a rebuttal to the horrid untruth that "Well, accidents will happen." (I might point out in passing that a similar notion that many diseases just can't be prevented from taking their inevitable toll persisted until recent decades.) However, I do have reservations about stating glibly of accidents, "They're caused," because, so it seems to me, we have done too little about delineating these causes, separating the essential from the less essential, and then using the results of our investigations to put into operation effective safety measures. One difficulty has been that we have not comprehended how complex the field of accident prevention is; we still don't. In fact, accident research and prevention activities are at least as complex as similar activities now being carried out in cancer and heart disease.

Psychological factors in accident production are extremely important. However, they are by no means everything. Anything which distinguishes a country, a region or a locality, and the people who are its inhabitants, will influence the number and kinds of accidents that are incurred. What we are talking about here is the ecology of accidents. You may remember that ecology is defined generally as the study of the relationships between an organism or organisms and their environment. Accidental poisoning, for example, is in the main a problem among small children; automobile deaths, among male teenagers and young male adults; fatal falls, among the elderly. Anyone could draw up a list of various factors residing in human organisms — infant, young, or old; male or female; rich or poor — which, in relation to particular aspects of the total environment, tend to yield certain kinds of accidents. You would then have the makings of a good many ecological studies in accident causation, more studies than the average research worker would be able to carry out in a lifetime.

I shall, however, largely ignore the total scope of the accident problem, and confine myself to the psychological aspects as they apply to the individual in his relationships with others.

As an example, a young woman, who was schizophrenic, was undergoing psychiatric treatment. She was aware that her first-born son was her favorite, and she resented the birth of a second boy, although he turned out to be a winning and beautiful baby. However, the resentment persisted. She had been known to "forget" him at the conclusion of visits to friends' and relatives' houses. When he was two and a half years old, he was left unattended, fell off a retaining wall into a lake and drowned.

Another example: a father, who was quiet and rather passive, was operating an electric saw in his basement. His two preteen-age boys began

to fight, and he ordered them to stop. They did not, and he proceeded to cut off the tip of his thumb.

Another example: A man who resented his wife's domination was asked by her to get an earthenware pitcher from a top shelf in the kitchen. Several times previously she had asked him to use the kitchen step-ladder for such tasks. He rushed into the kitchen resentfully, neglected the ladder and lost control of the pitcher which crashed into the stove and chipped off several square inches of porcelain. Only then did he turn around to see his small son staring up at him. The boy had silently followed his father into the kitchen. The pitcher had missed his skull by inches.

What, in general, lies behind these phenomena? We cannot avoid the conclusion that all of us are beset by destructive impulses, sometimes directed against ourselves, sometimes directed specifically against others, and sometimes directed in fused fashion against the whole human environment. In the latter instance, there are likely to be one or more innocent bystanders involved. These destructive impulses are largely unconscious, but in many instances (I think the majority) we have a degree of awareness of our destructive impulses. I believe that we can train ourselves to watch out for danger signals in our thoughts and actions — our behavior in general. And to the extent that these feelings are conscious, we can take steps to counteract them. The day will come when people will realize that certain feeling states strip them of their ability to perform complicated operations, indeed, sometimes of their ability to do much of anything besides sit quietly in a chair. The day will come when people will go beyond saying something like "You drive, I have a headache," to saying "You drive, I'm mad at the boss."

One specific difficulty is the problem of individuals with emotional disabilities so serious that destructive impulses are largely below the level of awareness, and others who have imperfect control of their impulses even though they are, to an extent, aware of them.

Certain drugs, especially beverage alcohol, should be mentioned for the reason that, in addition to impairing motor coordination, they may allow the release of destructive impulses that would otherwise be under control of the ego. An example of this was a traffic accident, reported several years ago in the press, which resulted in several deaths. A man and his wife were crashed head-on by another car crowded with teen-agers who had been drinking beer. The man, it turned out, had not dimmed his lights, and the teen-age driver was teaching him a lesson. The couple had eleven children, who were orphaned. I should like to call your attention to the fact that impulsive action in general may be a wildly inappropriate response to the stimulus. It is not one of the properties of the unconscious always to make accurate measurement of appropriate response. We may say to someone, "Drop dead." We may not realize that our unconscious literally may take us up on it.

I said earlier that I wanted to say something about obtaining data on the psychological determinants of accidents. A nondirective, or semi-nondirective, interview carried out as soon after the accident as possible would reveal more meaningful data than is now contained in many accident reports with their plethora of cut-and-dried entries, all too often filed and forgotten. I would want to know from the individual the hows and whys of the accident in his own words, whether anything had been bothering him recently, how his family and work relationships were going, how he felt just before the accident. Only after I had gotten a good deal of subjective data would I go after the more objective data. Lest this sound too easy, let me say that the learning of the technique of nondirective interviewing is not easy. However, many people can learn this technique if they are given intensive training.

It is obvious from all of this that all of us may be at least temporarily accident-prone at one time or another. Relatively fewer people are more or less accident-prone much of the time, but the degree and intensity of the tendency varies in these people too. We have not pinned down the concept of accident-proneness to the point where we can say, "So-and-so is accident-prone; so-and-so isn't." To put it another way, accident-proneness as a statistical concept remains very elusive. Certainly, any pat formulation such as 20% of people have 80% of the accidents is naive in the extreme. Such statements continue to be made because so many people are completely satisfied with any "answer," the simpler the better. The truth of the matter is that the study of accident causation in all its facets is one of the most complex problems facing our civilization. The elucidation of the accident problem will require the employment of our best skills and resources.

Formaldehyde in Wrinkle-proof Apparel Produces . . .

Tears for Milady

• H. G. BOURNE, JR., and
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Insufficiently polymerized resins, used for wrinkle-proofing clothing, may liberate toxic quantities of formaldehyde.

Although it is rare, the following letter demonstrates that tears for milady may have an unemotional source.

"There is some sort of gas — or condition — in the dress store I manage that causes our employees to have burning, stinging eyes and headaches. Customers coming into the store are also affected."

And this excerpt from a letter written by the owner of a small dress shop:

"I have a dress shop in Ohio. We have a peculiar, intolerable, suffocating odor that irritates the eyes, nose and throat. One employee is ill. This odor has occurred each spring for the past five years."

In each case the store proprietor or manager had asked the help of the local fire department and utility companies. Many possible sources were investigated; ammonia leaks from refrigerators, freon gas escaping from air conditioners, gaseous products of combustion given off by heating appliances and even sewer gas. Not guilty! Odors from adjoining dry cleaning stores and restaurants were accused by the dress shop owners, and bitter words were exchanged.

Although these complaints had an air of mystery, the Ohio Department of Health had an inkling of the trouble — formaldehyde gas. At least it was known that official health agencies in New York and Baltimore had reported similar complaints from cloth finishing mills and dress shops.

Moreover, the physical symptoms and reactions of the people working in the dress shops matched the recorded symptoms caused by exposure to formaldehyde gas. Flammable and colorless, formaldehyde gas has a pungent, suffocating odor and is intensely irritating to the nose and throat. It is used, in solution, as a germicide, a fungicide and in embalming fluids. Large quantities are employed in the manufacture of synthetic resins.

With this information, we decided to learn if formaldehyde was the culprit in the Ohio cases.

First, the air, in several dress shops from which complaints had been received, was tested for formaldehyde gas. Sure enough, the air did contain from 0.13 to 0.45 parts of formaldehyde per million parts of air. Not enough to cause illness, but sufficient to be intensely irritating.

Second, samples of apparel from these same shops were analyzed. Rayon dresses were found to contain 5. to 8. milligrams of formaldehyde per 10-gram sample; a cotton article, 3.4 milligrams. Yet a wool dress was free of this irritant substance. One could only conclude the eyes, nose and throat of customers and store employees were being irritated by formaldehyde gas escaping from the garments on display or stored in the shops.

Naturally, when the store owners were told the source of the irritating gas, they damned without discrimination those apparel manufacturers whose products were currently on display or in stock. This, as we shall see, was an injustice.

Let us examine the apparel on trial. From the labels on the garments it was learned that many had been treated in some fashion to give wrinkle resistance, water repellency or shrinkage control. Inquiries of the cloth manufacturers brought out the information that still other finishes had been devised to promote fire resistance, antistatic properties, protection against spotting, resistance to mildew and moth damage.

Moreover, it was found out that more than one finish may be combined in a single garment; for example, water repellency and wrinkle resistance treatment. According to one major producer of textile resins, roughly 80% of all rayons are treated in one or more of the above ways, 50% to 55% of the cottons, 5% of the wools, and rarely the acetates or dacrons. Wrinkle resistance and shrinkage control treatment are commonly applied to rayon and cotton.

The resins most widely used for this purpose are the melamine-formaldehyde and urea-formaldehyde types. The amount of resin retained by the fabric may be one fifth of its weight in a fully crease-resistant finish.

To understand why formaldehyde gas may be given off by the finished garment, it is necessary to know something of the changes that the foregoing resins undergo in the cloth finishing processes. The resins, as low molecular weight monomers, are water soluble and in this form are made to impregnate the cloth. Then, by means of heat and a catalyst, the resins polymerize, or unite with themselves, to form a large molecular structure, and uncombined formaldehyde is left in the cloth.

The resin is now no longer water-soluble. If the fabric is not processed in the heat chamber long enough or at sufficient temperature to dry thoroughly and cure (polymerize), the curing may be incomplete. If curing is not complete there is danger of formaldehyde remaining in the finished fabric. One resin manufacturer recommends that the cured resin-treated fabric be given a light but thorough wash to remove free formaldehyde and surface resin.

One finishing mill had this to say, "Liberation of formaldehyde may happen owing to: first, the fact that these resins are not totally stable (cured). Small amounts of formaldehyde may break away from the chemical compound, and second, there is some free formaldehyde present in fabrics so finished." This company endeavors to obtain 90% polymerization of their resins, and to limit uncombined formaldehyde to less than 200 parts per million.

Thus, it is evident that the finishing mills are cognizant of the objectionable aspects of formaldehyde release from their product. But perhaps they are not aware to what extent this gas has irritated the retail merchants and their customers, as well as employees of the garment manufacturing establishments.

In defense of the finishing mills it must be said, however, that they are no doubt engaged in a running battle for economical production and a competitive product versus a quality product which, in this particular instance, means finished goods from which there is no objectionable release of formaldehyde gas.

The problem of irritant formaldehyde gas should not be unique to Ohio. Rayon and cotton apparel treated for wrinkle resistance and shrinkage control are offered for sale throughout the nation.

This supposition was confirmed when other city and state health agencies were questioned. For example, the cities of Detroit, Houston, Philadelphia, Milwaukee, and Charlotte, North Carolina, have received eye irritation complaints from owners of small dress shops. Garment manufacturers in New Jersey, Pennsylvania, New York and California have sought assistance from their respective state health agencies to remedy the gas irritation. In Massachusetts, material wholesalers experienced formaldehyde trouble; and in North Carolina, a man employed in a textile mill claimed workmen's compensation because he alleged his health had been impaired as a result of exposure to the gas.

There was unanimity of opinion, with one exception, that the amounts of formaldehyde gas found in dress shops and garment manufacturing work, although not actually hazardous to health, are a severe irritant. The exception was a large wholesale garment storage facility in which the amount of formaldehyde gas was five times the quantity considered to be injurious to health!

Until such time as the cloth finishing producers are able further to reduce the residual formaldehyde in their product or to discover a less irritating substitute, there is but one remedy for the garment manufacturers and dress shop proprietors — adequate ventilation. A ventilation rate equivalent of 15 air changes per hour should be sufficient during the critical seasons.

The irritant effect appears to be intensified during spring and early summer when shipments of rain coats, bouffant petticoats, and summer rayon and cotton dresses are received.

Tears for milady may be a by-product of science and not the whimsey of the female fashion world.

Effect of Footgear

upon the Energy Cost of Walking

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In spite of the ever-increasing motorization of transportation, walking is still of great practical importance. Not only hikers, mail carriers and foot soldiers, but also industrial workers are concerned with comfort and energy expenditure in walking.

In choosing an ideal pair of work shoes or boots, one is looking for footgear that will provide maximum protection and comfort with minimum energy expenditure.

Recently two changes in footgear construction, which supposedly have brought it nearer to the ideal, have been introduced. One is the "functional" insole and the other is the "ripple" sole.

The "functional" insole was originated by Dr. R. Plato Schwartz, an orthopedic surgeon.[1] The functional insole is made from a conventional one by placing a wedge-like polyethylene insert over the medial half of the heel. The insole is 3 18 inches thick at the outer edge, 1¼ inches wide and 6 inches long. It is about half the width of the heel and extends under the longitudinal arch.

The "ripple" sole, an invention of a retired shoe salesman, Mr. Nathan Hack, is made of rubber and has transverse ridges, about ½ inch high, which slant backwards. From the side they give an impression of a set of shark's teeth. Because both of these innovations have had many devoted enthusiasts, it was decided to investigate whether they make walking easier and more economical.

Materials and Methods

Footgear: American, British and Canadian military boots, and American army dress shoes (low quarter) were used for this study (Figure 1). The American footgear was made with a standard and with the Hack "ripple" sole. One half of the American footgear had conventional insoles and the other half had functional insoles. All footgear had leather uppers. Thus, there were 10 types of footgear, altogether 138 pairs. American and Canadian boots came in sizes from 8 through 10 and in widths B, D and EE. British boots came in sizes 8, 9, 10 and in three widths; small, medium and large. Each subject was fitted with one pair of each type of footgear, 10 pairs in all. As a rule, subjects wore one pair of cotton socks. An exception was made for British cold-wet boots, in which case two pairs of socks were used.

Walking: Was done on an electrically driven treadmill. The speed was 3.45 miles per hour.

Energy cost: Energy cost was determined from oxygen consumption by the closed circuit method, using a converted 120-L. spirometer. Each subject had one or more orientation sessions in walking on the treadmill and in breathing through the closed circuit.

Subjects: Subjects were male college students ranging from 145 to 195 pounds in weight and from 64 to 74 inches in height.

Precautions: Since the energy cost could be influenced by the weight of the footgear and the length of step, measures were taken to determine the extent of these influences.

Weight of Footgear: Footgear was weighed, and the location of the center of gravity was determined. Tests were then conducted in which some lighter footgear was made equal in weight to a heavier one by placing needed ballasts in such a manner that the center of gravity of the loaded boot was at the same location as in the heavier boot.

Length of Step: Keeping the speed of the treadmill constant, subjects were made to walk both at a predetermined length of step by following the cadence of a metronome, and at their own natural length of step.

This study was supported by the Q. M. Research and Engineering Center, Natick, Mass. Contract DA-19-129-QM-309.

Walking Surface: No attempt was made to vary the surface of the conveyor belt of the treadmill.

Results

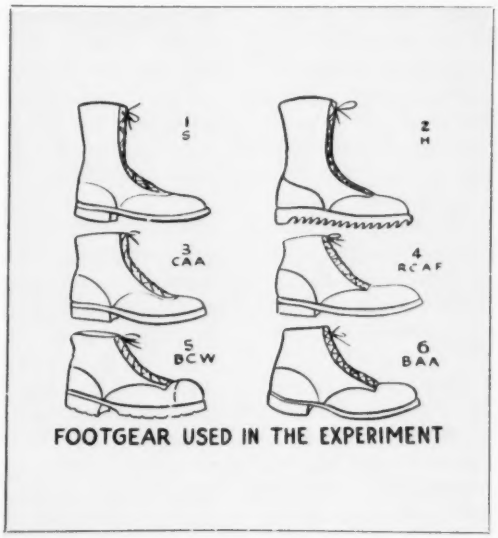
Energy Cost (Table I): (1) *Low Quarter Shoes, Conventional vs. Functional:* Fifteen subjects were used twice, once in the morning and the second time in the afternoon, in both types of shoes walking on a horizontal treadmill for six minutes. The mean O_2 uptake in cc/kg/min. (STPD) was 11.65 for conventional and 11.68 for functional insoles. Analysis of variance showed no statistically significant difference in effect between the types of shoes or the times of day.

(2) *British and Canadian Boots:* Four types of footgear were used on 15 subjects. The respective means for O_2 in cc/kg/min. were BCW —12.85, BAA—12.35, CAA—12.83 and RCAF—12.39. Statistical analysis showed that BCW and CAA formed a group significantly more expensive than the other group consisting of BAA and RCAF. There were, however, no intragroup differences detectable by the use of the Duncan Multiple Range Test.

(3) *British Boots with Equalized Weight and Length of Step*: Since the British cold-wet (BCW) boot was much heavier than the British, ankle, army (BAA), the difference between the means being 13.77 ounces, it was decided to equalize their weight. This was done by attaching to the BAA boot a piece of gooch rubber tubing filled with lead shot so that the center of gravity of the loaded BAA boot would be at the same location as the center of gravity of the BCW boot. The length of step was equalized by making subjects walk in cadence with a metronome set at 120 beats per minute. The mean O_2 consumption was: BCW—12.45, BCW with metronome—12.44; BAA with added weight and metronome—12.58, BAA with metronome—12.31, BAA with added weight—12.22 and BAA 11.86. Analysis of variance and the Duncan test showed that the mean for walking in non-weighted BAA boots was significantly lower than that in other footgear, except for weighted BAA boots without the metronome. On the other hand, when the weight of BAA boots became equal to that of BCW boots, the previously observed difference in the energy cost disappeared.

Figure 1

Names and abbreviations for boots and the average weight of a pair in ounces: (1) U.S.A. Standard sole: conventional insole BSc-66.2 oz. and functional insole BSf-68.9 oz. (2) U.S.A. Ripple sole: conventional insole, BHc-69.4 oz. and functional insole, BHf-72 oz. (3) Canadian, ankle, army, CAA-70.6 oz. (4) Royal Canadian Air Force, RCAF-55.8 oz. (5) British, type 15 cold-wet, BCW-80.2 oz. (6) British, type 16 ankle, army, hobnailed sole, BAA-66.4 oz. The dress shoes are not shown. They were low quarter: conventional insole, LQc-40.6 oz. and functional insole, LQf-42.13 oz.



FOOTGEAR USED IN THE EXPERIMENT

(4) *American Boots:* Four types of footgear and 15 subjects were used. Each test was repeated twice. The mean O_2 consumption was: BSc — 12.05, BSf — 12.16, BHc — 12.13, BHf — 12.10. There was no statistically significant difference in energy cost for different footgear and between the two series of tests.

(5) *American and British Boots*: The duration of the test was extended to 30 minutes. Six

TABLE I.

ENERGY COST OF WALKING IN VARIOUS TYPES OF FOOTGEAR (O_2 CONSUMED, CC/KG/MIN. STPD)

Treadmill, Horizontal, 3.45 miles per hour

Results of the Duncan Multiple Range Test. Any means *not underscored* by the same line are significantly different from each other at the 1% level except experiment 3 where the level is 5%.

1. Low Quarter Shoes		2. British and Canadian Boots			
LQc*	LQf	BCW	CAA	RCAF	BAA
11.65	11.68	12.85	12.83	12.39	12.35

3. British Boots, Effect of Weight and Cadence					
BCW	BCW c**	BAA wc**	BAA c**	BAA w**	BAA
12.45	12.44	12.58	12.31	12.22	11.86

4. American Boots			
BSc	BSf	BHc	BHf
12.05	12.16	12.13	12.10

5. American and British Boots					
BSc	BSf	BHc	BHf	BCW	BAA
11.62	12.47	11.93	12.10	12.60	12.30

6. American, British and Canadian Boots, 5° Inclination, 3.45 m.p.h.							
BSc	BSf	BHc	BHf	BCW	BAA	RCAF	CAA
26.72	25.12	26.38	25.95	27.51	26.08	25.90	22.46

*For explanation of abbreviations see Figure 1.

**c- cadence, controlled by metronome; w- weight added, wc- both.

subjects were tested twice in each of the six types of boots in order to test reliability. The mean for O_2 consumption varied from 11.62 to 12.60. No statistically significant difference was found.

(6) *American, British and Canadian Boots*: Four subjects walked for 10 minutes at 3.45 mph on a 5° slope in each of eight types of boots. The means of O_2 consumption more than doubled as compared with that during walking on a horizontal plane, but again they were not statistically different from each other.

Comment

Originally it was planned to run concurrent experiments with all footgear. Unfortunately, all types of footgear did not reach the laboratory simultaneously. For this reason six series of partial tests were conducted. This modification in design required repetition of several tests with some of the same types of footgear. These repetitions, while on one hand introducing a complicating element in statistical deductions, served on the other hand as warning signals for a more critical attitude toward collected data.

While in the first four experimental series, the number of subjects was 15 and the number of tests varied from 60 to 120, in later series smaller numbers of subjects were used because it became evident that there was more similarity than difference in the effects of various boots upon the energy cost of walking, and the investigation began to assume hair-splitting characteristics which had little, if any, practical importance.

Weight of Footgear: Both the polyethylene insert or functional wedge and the Hack ripple sole slightly increased the overall weight of the footgear. The inserts weighed from 10.38 to 10.62 grams or about ⅓ of an ounce for a size nine shoe (personal communication from Mr. Raymond A. Mills of the Endicott Johnson Corporation). However, the insert increased the weight of a pair of low quarter shoes about 1.57 ounces, or about .75 of an ounce per shoe, and the weight of boots by about 2.6 ounces. The extra weight probably depended on a longer heel pad and the weight of cement.

The ripple sole added about three ounces to the weight of a pair of footgear. When both functional insert and ripple sole were incorporated into the footgear, the weight per pair was increased on the average about 5.7 ounces, as compared with standard boots.

Position of the Center of Gravity: If two types of boots are of the same weight, that boot in which the distance of the center of gravity from the sole is greater will require less energy from the wearer, because the moment of resistance force is shorter. On the other hand, if the distance from the heel is greater, then, when the foot is extended, the moment of resistance will be increased. The advantage of a higher location of the center of gravity may be nullified by an increased distance from the heel.

Thus, the distance from the sole and the heel have either an additive or a neutralizing effect.

Length of Step (Table II): In analyzing the effect of the various boot types, it was found that the weight of the boot did not affect the length of step. Subjects wearing the British, ankle, army boot (BAA) had the same length of step, regardless of whether the boot was weighted. In addition, when walking in the heaviest British boot, the cold-wet (BCW), subjects had the longest length of step and, while walking in the Royal Canadian Air Force (RCAF) boots which were the lightest, they had the second longest step. This leads to the conclusion that some feature of the footwear other than weight determines length of step. Demeny[2] had shown that the length of the roll of the foot on the ground increases with the length of the outsole; and the length of step, in turn, is increased by the increased roll. In comparing the British cold-wet boot (BCW) with the British, ankle, army boot (BAA) it was found that, although the length of the sole did not differ appreciably between boots of the same size, the roll of the BCW on the floor was 0.5 to 0.8 cm longer than that of the BAA.

Demeny also had stated that a long rigid sole was ideal for lengthening the step, but that it required so much effort that its use was fatiguing. In contrast to this observation, it was found in this laboratory that the ripple sole, which is quite flexible, increased the roll of the foot on the ground by .3 to 1.0 cm as compared with the standard outsole. This effect is undoubtedly caused by gliding action due to the high transverse ridges used in the construction of the ripple sole and easily may be demonstrated. If a man wearing shoes with this sole rocks from heel to toe, a forward progression will easily be observed. If his rocking is moderate, he may move a total of 5.0 cm in ten rocking motions or .5 cm per motion. More vigorous rocking will increase the distance to 1.4 or 1.5 cm per motion. This does not happen in shoes with standard soles.

The Hack sole increased by about 0.5 inch the mean length of step of subjects wearing the American combat boots.

The functional insert had no effect on the length of step while walking in either the low quarter shoes or American combat boots.

TABLE II.
LENGTH OF STEP (INCHES) IN VARIOUS TYPES OF FOOTGEAR

Treadmill, Horizontal, 3.45 miles per hour
Results of the Duncan Multiple Range Test. Any means *not underscored* by the same line are significantly different from each other at the 1% level.

1. Low Quarter Shoes		2. British and Canadian Boots			
LQc*	LQf	BCW	RCAF	CAA	BAA
30.60	30.61	31.52	30.87	30.78	30.68

3. Effect of Weight. BAA was made equal in weight to BCW.

BCW	BAA (loaded)	BAA (natural)
31.64	30.85	30.84

4. American Boots			
BHc	BHf	BSf	BSc
31.65	31.59	31.12	30.99

5. American and British Boots					
BHf	BCW	BHc	BSc	BSf	BAA
31.45	31.27	31.19	30.95	30.94	30.66

6. American, British and Canadian Boots, at 5° Inclination, 3.45 m.p.h.

BSc	BSf	BHc	BHf	BCW	BAA	RCAF	CAA
32.38	31.72	31.90	31.84	32.10	31.27	31.55	32.07

*For explanation of abbreviations see Figure 1.

Energy Cost: The energy cost of walking was not discernibly affected by difference in the weight of the boots. The only increases in energy cost which were large enough to be significant occurred in two groups of British and Canadian boots. The British cold-wet and Canadian Army boots formed one group not significantly different from each other, and the British Army and the Canadian Air Force boots formed a second. The difference between the two groups was, however, significant. These differences disappeared when walking was done upgrade.

When the weight of the British Army boot was made equal to that of the British cold-wet by adding weights, there was no significant increase in energy cost as compared with that of walking in unweighted boots. Thus, an average weight difference of 13.43 ounces was not large enough to affect measurably the energy cost of walking in the boot types.

In a study made by Draper, Edwards and Hardy,[3] in which subjects walked on a treadmill while wearing tennis shoes with attached weights varying from 0.6 kg to 2.4 kg (21.2 to 84.7 ounces), it was found that the energy cost increased significantly. However, when the present investigators applied the Duncan Multiple Range test to their results, the only significant difference found among the four means was between the highest and lowest. This weight difference was 1.8 kg or about 63 ounces, much larger than the difference in the present study.

The negative results of both the 30-minute walk on the horizontal plane and the 10-minute walk on the 5° slope are probably due to the small number of subjects used in these phases.

It must be stated here that almost all subjects reported that walking in the footgear with ripple soles was the most comfortable because of the "spring" effect of the rubber corrugations. This observation probably explains the increasing popularity of this type of sole among people who must either walk or stand for extended periods on a hard floor.

Summary

Eight types of American, British and Canadian military boots and two types of American military dress shoes were used. Half of the American boots and shoes had two experimental changes incorporated in the design: either functional insole or ripple sole or both. Subjects walked at 3.45 miles per hour on a horizontal plane and 5° incline on a motor-driven treadmill. The experimental modification of the footgear construction made no change in the energy cost. There was no statistically significant difference in energy cost for any boot when walking was done under stress.

Subjects unanimously commented on the feeling of comfort when wearing footgear with a ripple sole.

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The Nurse's Role

in Health Maintenance and Accident Prevention

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Because she is familiar with the types of injuries being investigated in the plant, the nurse is uniquely qualified to cooperate with physicians and safety teams in a program of health and safety.

To explore adequately all the fields suggested by this title would make it necessary for one to read many opinions of the many specialists on the industrial health maintenance team and on the safety team. There undoubtedly would be opinions of management, whose responsibility in safety and accident prevention is paramount. Unquestionably there would be opinions of labor. However, a program for Health Maintenance and Accident Prevention is one composed of elements and services designed to maintain the health of a work force; to prevent or control occupational and nonoccupational diseases and accidents, and to prevent and lower disability and time loss resulting therefrom. I will discuss the role that the industrial nurse plays in the conduct of these basic elements and services as they affect accident prevention.

For the purpose of discussion, one can postulate that, in general, good health means greater work efficiency, and that the most efficient worker is the safest worker. Increased production at the expense of injury to employees is no longer tolerated and there are ample statistics which prove that the safest workers are the most productive and that the safest way is the most profitable way to work.

In large industrial plants one may find nurses, safety engineers, industrial hygienists, physiologists, psychiatrists, psychologists, anthropologists, dentists and physicians employed on the health maintenance team. Most frequently, however, especially in small plants, one finds but one or two of these groups represented. The nurse working in industry is often the only medical representative on the team in the plant. The extent of her responsibility and her opportunities in health maintenance and accident prevention is pointed up by the fact that the composite accident rate of small plants is two and a half times as great as large ones. It is important therefore that the nurse working without supervision learn to work effectively.

It is generally recognized that industrial health maintenance programs are inadequate if designed only to cope with the manifold hazards to health and efficiency as they arise on the job. One large company recently reported that 60 times as much time was lost as the result of illness and injury incurred off the job as on the job. Time lost as the result of industrial diseases should not be ignored. Though less than 2% of claims presented before Workmen's Compensation Commissions are the result of industrial diseases, this does not mean that industrial diseases are unimportant. It does mean that they are well controlled. They have been conquered largely by the application of preventive health measures.

Proof that concern about accidents in industry is well founded is offered by a review of statistics that show 80% of accidents in industry are the result of "human" failure. It is obvious, therefore, that if accident prevention programs were 100% effective, but confined only to the technical and mechanical, 80% of present accidents would continue.

Presented at the Industrial Nurses' Section of the Nineteenth Annual Southern Safety Conference, Hotel Peabody, Memphis, Tennessee, March 2-4, 1958.

Accidents are the leading cause of death up to age 35. Based on experience in 1956, two men will have been killed at work and 230 others permanently, or temporarily, totally disabled by accidental means during each hour in an average working day.

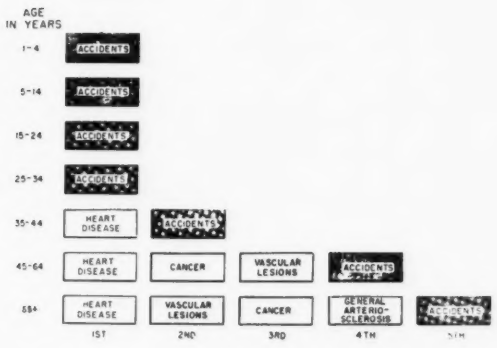

Figure 1

In the year 1956 there were 14,300 killed on the job and 2,000,000 permanently or temporarily totally disabled. There were 32,000 killed away from work and 2,500,000 permanently injured. This does not include the millions of accidents that occurred during 1956 but were not recorded statistically because there was no disability and the person continued on the job.

It is interesting that, although we point with pride to statistics proving that employees are safest at work, we overlook the fact that on-the-job injuries are apparently more serious. The National Safety Council reports one study that indicates that although fatalities occur four times more frequently off the job than on the job, the average time lost per case was 39 days for work injuries compared with 19 days for injuries away from work.

In 1956 workers injured on the job lost 45 million days of work compared to 60 million lost by those injured off the job. However, it has been estimated that on-the-job injuries cause an indirect time loss which is equivalent to four times the direct loss.

Source of Compensable Work Injuries

It will help to be effective if the principal sources of accidents on the job and the incidence of injury to different parts of the body are known. Although one can read statistics and thereby get a good idea generally, one must depend on medical department plant records and reports to indicate where emphasis is to be directed. Inasmuch as accidents cause more deaths and disability than any other single known disease entity in the United States, in the future, greater emphasis will have to be placed on the application of preventive medicine and its epidemiologic techniques for the determination of to whom, to what part, and how and where accidents happen. The epidemiologic approach so successfully used in combating disease may well prove to be equally effective in accident prevention.

Consider the sources of accidents. According to the statistics in Figure 2 compiled by the National Safety Council and based on records kept by participating companies, handling of objects is the principal source of compensable work injuries. Falls from the same or different levels are next, while falling objects and machinery accidents are about of equal importance as the third and fourth causes.

The most costly injuries per case result from falls from one level to another. About of equal cost are injuries from motor vehicle accidents, contact with harmful substances, and elevator and hoist accidents.

Fatalities are caused most frequently by vehicle accidents.

Part of Body Injured

Safety Council figures indicate that most injuries are sustained as shown in Figure 3.

It is not generally appreciated that injuries to the trunk of the body are next in number to injuries of the upper extremities and outnumber injuries to the lower extremities, or that 70% of all injuries to the region of the head are injuries to the eyes.

In my compilation of elements and services of an effective Health Maintenance-Accident Prevention Program, I include the following:

1. Industrial Hygiene Survey (Plant Hazard Inventory)
2. Pre-employment Screening (Health Inventory)
3. Preplacement Physical Examination
4. Care of Industrial Accidents and Diseases
5. Health Counseling
6. Periodic Health Examinations
7. Health Education
8. Constructive Medicine
9. Safety Activities
10. Records and Reports

Plant Industrial Hygiene Survey (Plant Hazard Inventory)

Before the industrial nurse can perform her role effectively in the operation of the health maintenance program, she must have the proper background information. She must have a clear knowledge of the hazards within the plant and take inventory of them. To acquire this knowledge she must familiarize herself with

SOURCE AND COST OF COMPENSABLE WORK INJURIES

Source of Injury	All Disabling Injuries	
	% of Cases	Ave.* Cost per Case
Total	**100.0**	**$ 679**
Handling objects, manual	24.4	568
Falls	18.0	900
Same level	*9.5*	*698*
Different level	*8.5*	*1,129*
Struck by falling, moving objects	10.1	545
Machinery	9.8	691
Vehicles	7.6	990
Motor	*5.6*	*1,066*
Other	*2.0*	*780*
Stepping on, striking against objects	6.6	313
Hand tools	6.5	460
Elec., heat, explosives	3.1	685
Harmful substances	2.6	1,059
Elevators, hoists, conveyors	2.3	1,022
Engines, motors	.4	713
Other	8.6	630

Source: 1954 reports on compensable work injuries from Florida, Illinois, Minnesota, New Jersey, New York and North Carolina.
***Wage compensation only.**

ACCIDENT FACTS 1957 Edition

Figure 2

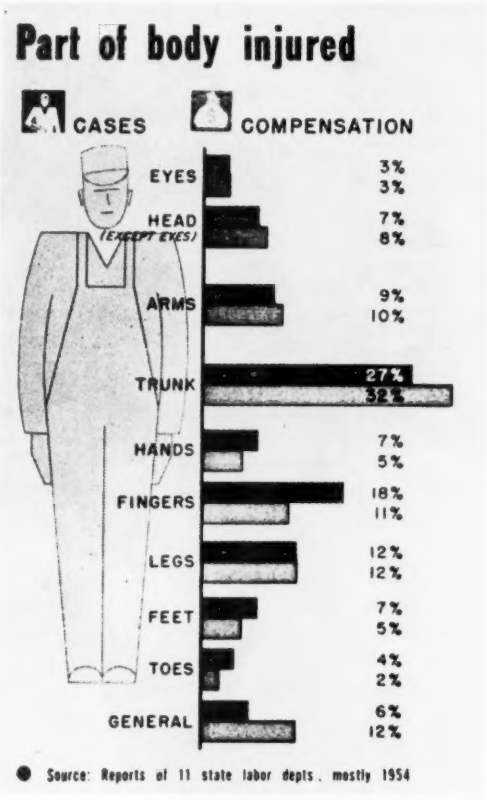

Figure 3

plant processes, jobs and job requirements.

Industrial hygiene surveys are surveys of plants made from the health and medical standpoints. I refer to them as plant hazard inventories. Ideally, the conduct of these surveys is supervised by the occupational or industrial physician, or by the industrial hygienist. It is not unusual for these specialists to be assisted by engineers, safety experts, industrial nurses, toxicologists, chemists, physiologists and private and governmental agencies. Their intent is to study the environment and operations of the plant and to discover, inventory, predict and correct all plant hazards affecting the health and safety of the worker. Typically, these work hazards may include excess noise, faulty lighting, heat, humidity, exhaust and ventilation, sanitation, concentration of dusts and toxic substances in excess of established maximum allowable concentrations, and chemical and mechanical hazards.

Without such specialists, however, the industrial nurse must conduct her own survey by finding out all she can from anyone who can give her pertinent information and by observation and inquiry as she visits every part of the plant at frequent, regular intervals. She then enlists aid in correcting the environmental hazards noted. She will make effective her knowledge that poor housekeeping results in increased accidents and conversely that good housekeeping will reduce accidents.

She will enforce her knowledge that proper sanitation is of extreme importance in the maintenance of health; that in-plant dining facilities must be inspected and deficiencies corrected; that proper washing and toilet facilities and locker rooms must be present and maintained in a sanitary and safe condition.

She learns that there are particular health hazards peculiar to certain jobs, and that even though these hazards are seemingly controlled she must give special attention to the men so employed so that she will recognize the earliest change and take immediate steps to correct their progress, to effect cures and, most important, to restore controls and prevent recurrences.

When the nurse has, through use of the technique of the industrial hygiene survey, familiarized herself with the operations of a specific plant, has acquainted herself with this inventory of hazards to health and safety, knows some-

thing of the techniques used and the disciplines available for their correction or elimination, understands the skills, physical and mental requirements of various jobs, she has the background for playing a most effective role in the successful conduct of the other basic elements and services of the health maintenance and accident prevention program.

Pre-employment Screening (Health Inventory)

Pre-employment screening is a function of the personnel department or employment office. This is a management responsibility. Enough men must be employed to operate the company profitably. Those selected must meet the standards of job skills and health requirements designed to operate the company most efficiently. The ultimate level of their efficiency is dependent upon their proper selection, proper placement, training and maintenance.

It has been my experience that if a personnel department expects to do a good job of primary screening and selection of applicants, it will call its medical or nursing staff into consultation to talk about the physical, mental and general health standards which they expect prospective employees to meet. Whether the candidates meet these standards is determined finally by the physician at the preplacement examination, done either at the plant or at the doctor's office. But the opportunity for use of the health inventory part of the preplacement examination, which includes inquiry into personal, family and medical history, should not be delayed, especially if the actual physical examination is to be delayed or performed away from the plant. The health inventory or questionnaire should be completed as fully as possible at the plant by the nurse, and the information gleaned made a part of the initial personnel screening procedure.

If certain handicapped individuals come to her attention, the nurse can point out that it is frequently advantageous to hire them if their abilities and skills can be used safely. She knows that when properly placed the disabled are not more subject to accidents than are others, while their absenteeism records are frequently better.

The personnel department as a rule does not permanently hire people until after review of the results of the physician's physical examination. They may, however, delay this part of the preplacement examination. Some personnel departments will routinely select and hire groups of people for a probationary length of time, after which, if these workers are acceptable, they are sent to the medical department for physical screening and recommendation for final acceptance or rejection.

I find great fault with a system of delay of physical examination and feel that industrial nurses can help educate management to the faults of such a system. The nurse can point out the danger in hiring men whose ordinary perceptive abilities, such as eyesight and hearing, have not been adequately tested.

An alert nurse will point out that if a man is occupationally blind or is color blind, he should not be given an opportunity to injure himself or others. Likewise, hypertensive employees may black out, become dizzy or fall, break their backs or otherwise injure themselves in the absence of knowledge of their susceptibilities.

In addition, it is simply humanitarian that a man not be under the emotional strain of worrying about having ultimately to pass a physical examination at the end of a trial period. This hazard should not be added to those which already exist on the job. Besides, all have had the experience of having a probationary worker have an "alleged" injury shortly before the expiration of his probationary period to use as a "lever" against the company in case he does not later pass the physical examination.

In studying the record of one personnel department in my practice, I found that the rejection rate on physical examinations was exceptionally high. This particular company was purposely highly selective because of the many serious hazards involved in its operations, but I felt that many of the people being submitted for preplacement examination at the clinic should not have been sent to me. That is, these persons should not have been considered beyond the employment office. Preplacement screening and the taking of good health inventories should have eliminated many of them at that point. Finally, I had a talk with this company's personnel staff and they reorganized their preplacement screening procedure by using the information obtained in the health inventory portion of the medical examination. The cost of their preplacement medical examination program, which was on a per case basis, was markedly reduced.

I see no reason for industrial nurses to feel hesitant about suggesting that they, together with the resident company doctor or the designated doctor on call, design a physical examination form (Figure 4) for their particular company, one to identify and screen out certain "apparent" physically or mentally unsatisfactory employees.

The industrial nurse can, by using the form shown or any good form, with careful inquiry, discover many conditions which in themselves might preclude the employment of an applicant in a specific job. Many of these conditions inherently make the man an unsafe worker. If, in the applicant's answers to specific inquiries,

Medical Examination

Date _____ For: Employment _____ Re-examination _____ After Disability _____
Full Name _____ Occupation _____
Age _____ Race: W _____ C _____ Other _____ M _____ F _____
Married _____ Single _____ Widowed _____ Divorced _____ Separated _____ Number of children living _____
Have either of your parents or any brothers or sisters had tuberculosis? _____
Diabetes? _____ Epilepsy? _____
Have you ever had

Yes	*No*		*Yes*	*No*		*Yes*	*No*	
( )	( )	Frequent headaches	( )	( )	Asthma	( )	( )	Kidney trouble
( )	( )	Dizzy or fainting spells	( )	( )	Hay fever	( )	( )	Diabetes
( )	( )	Brain or nervous trouble	( )	( )	Tuberculosis	( )	( )	Ever take insulin
( )	( )	Loss of consciousness	( )	( )	Spitting of blood	( )	( )	Frequent boils
( )	( )	Paralysis	( )	( )	Heart trouble	( )	( )	Dysentery
( )	( )	Fits of epilepsy	( )	( )	Swelling of ankles	( )	( )	Piles
( )	( )	Frequent sore throats	( )	( )	Shortness of breath	( )	( )	Rupture or hernia
( )	( )	Discharging ears	( )	( )	Stomach ulcers	( )	( )	Varicose veins or ulcers
( )	( )	Pneumonia	( )	( )	Appendicitis	( )	( )	Rheumatism
( )	( )	Pleurisy	( )	( )	Gallstones	( )	( )	Scars

Remarks _____
Have you ever had back trouble or treatment for back trouble? _____
What other serious illnesses have you had? _____
History of Hospitalization: Yes _____ No _____ When _____ Operations: No _____ Yes _____
Where _____
What injuries have you ever received: _____
When? _____ How long disabled? _____
Have you ever received compensation for any injury? No _____ Yes _____ Explain: _____
U. S. Military Service: Accepted _____ Rejected _____ Cause _____
Have you ever or are you now receiving compensation for service connected disability? Yes _____ No _____
Percentage _____
Have you ever been rejected upon physical examination? _____
When? _____ By whom? _____ Cause of rejection? _____
For Female Applicants: Last menstrual period date _____
Cramps or headaches in association with period? _____ Marked change past 12 months? _____
Remarks:
I certify that my answers to the foregoing questions are recorded above fully and correctly and that said answers are true.

Address _____ Signature of Employee _____

Figure 4

Physical Examination

General appearance: Good _____ Fair _____ Poor _____
Temperature: Normal _____ Elevated _____ Tall _____ Average _____ Short _____ Weight _____
Examine and record defects of: Scalp, eyes, ears, nose, teeth, throat, tonsils, neck, chest, abdomen, spine, arms, hands, legs, feet, joints, skin:
Blood pressure: Systolic _____ Diastolic _____
Pulse rate _____ Regular: Yes _____ No _____ Good volume: Yes _____ No _____ Other _____
Any evidence of disease of the heart: No _____ Yes _____ Explain: _____
Any evidence of disease of the lungs: No _____ Yes _____ Explain: _____
Reflexes:
Pupillary: Normal _____ Abnormal _____ Patellar: Normal _____ Absent _____
Decreased _____ Hyperactive _____
Pupils: Equal _____ Unequal _____ Regular _____ Irregular _____ Cross eye: No _____ Yes _____
Bends to touch floor with fingertips: Normal _____ Limited _____ Inches from floor _____
Squats on heels: Normal _____ Limited _____
Rhomberg Test: Normal _____ Abnormal _____
Evidence of Hernia: No _____ Yes _____ Loss of Limb: No _____ Yes _____
Hydrocele: No _____ Yes _____ Ankylosis: No _____ Yes _____
Varicocele: No _____ Yes _____ Deformity: No _____ Yes _____
Varicose veins or ulcers: No _____ Yes _____
Other impairments:
Vision:

Without glasses:		Glasses worn: No _____	Yes _____
R.E. _____/_____		With glasses when worn:	
L.E. _____/_____		R.E. _____/_____	
		L.E. _____/_____	
Without glasses:		With glasses when worn:	
Near Vision: (Jaeger Test) R.E. _____/_____		R.E. _____/_____	
L.E. _____/_____		L.E. _____/_____	

Hearing: Right ear _____ Left ear _____
Laboratory Urinalysis:
Albumin: Negative _____ Positive _____ Sugar: Negative _____ Positive _____
Blood: V.D.R.L.
Kahn: Negative _____ Positive _____
I hereby certify that having examined the applicant named herein, I recommend that his (her) application for employment be approved: Yes _____ No _____
Reason applicant is not recommended for approval _____
Chest X-Ray: Yes _____ No _____ Date _____

_____ M.D.
Medical Examiner

Report of physical examination reviewed and applicant is _____ recommended for approval.

_____
Personnel

Figure 5

he states that he has epilepsy or "fits" uncontrolled, he cannot qualify for a vast number of jobs. If any employee admits having had a recent heart attack, demonstrated by electrocardiographic examination, has had a prolonged period of hospitalization and is continuing therapy, it is reasonable for the personnel department to reject that applicant for current employment on scaffolding, as an unrestricted crane operator, hard laborer, or perhaps even for less arduous jobs. At the same time, it is not in the province of personnel departments and resident industrial nurses to attempt to diagnose, to treat or to prevent the gainful employment of those handicapped in some aspect of health. Still, it is evident that one must take advantage of the skill and judgment of industrial nurses in the screening process.

If a company does not have an "in-plant" physician, the nurse may complete as much of the mechanical detail of the medical examination as her medical consultant advises. This detail need not include opinions, diagnoses or prognoses. I believe it completely proper for nurses operating "in-plant" under signed "Standard Procedures for the Industrial Nurse," as promulgated by the American Medical Association, to perform those mechanical and investigative procedures indicated on a standard form (Figure 5) for medical examination.

After these data have been recorded, the medical examination form represents a fairly complete health inventory for the doctor to review and elaborate. Thus a tremendous amount of time is saved, and a guide is furnished to the doctor for added or special emphasis.

Preplacement Physical Examinations

After preliminary screening by the personnel department, the remaining applicants are scheduled for examination by resident full- or part-time plant physicians or sent to the physician's office for completion of the preplacement physical examination. It is the responsibility of the physician to review and to complete the health inventory section of the pre-employment questionnaire and to complete the actual physical examination. He may delegate those parts of the physical examination normally done by his nurses and technicians. He must, however, assume complete responsibility for them. The importance of the role of the nurse in the preplacement examination and the extent of responsibility delegated to her will vary with the degree of understanding of the physician. It will grow to maximum proportion where there is the most understanding of her role in industry and where the physician's confidence has been earned by the industrial nurse.

If the nurse will observe and listen carefully during the conduct of the preplacement physical examination, she frequently can be of great assistance in identifying the nervous or emotionally disturbed candidate. She often can spend more time with him than the physician can afford and may note significant deviations from normal. One of the principal functions of the nurse in the conduct of the preplacement physical examination is to elicit confidence in the medical department by her kind, considerate and understanding attitude. She is most often the first member of the health maintenance team to come into contact with the prospective employee. She must make the prospective employee feel that he is very welcome to come back for attention in the future.

Care of Industrial Accidents and Diseases

The role of the industrial nurse in the care of industrial accidents and diseases is the one in which she is most often pictured. It is not her most important role. It is important that she use good judgment in the selection of cases which she elects to treat. She can prevent much disability by early recognition of, or suspicion of, serious injuries to the head and eyes, skeletal, muscular, vascular and body systems which may not be apparent except on careful observation. Prompt referral of these injuries to the company physician for proper treatment frequently prevents the occurrence of more serious accidents. Prevention of infection is a cardinal function of the industrial nurse. Indeed, infection may make a reportable injury of one not previously reportable.

Again, the nurse in industry should offer her services in conformity with the A.M.A.'s "Standard Procedures for Industrial Nurses." This includes care for minor conditions or illnesses for which an employee might not take the time to consult his family physician or for which he might not want to leave his job.

In cases of serious accidents or illness, the nurse must render the emergency first aid measures which her understanding and training warrant, until she has been relieved of responsibility by a physician. Her prompt and intelligent action in extreme emergencies frequently will result in saving of lives and prevention or decrease of disability.

Health Counseling

Health counseling is simply the giving of advice in health matters. The nurse in industry who has earned the confidence of those about her will find that she is sought out in consultation for answers to many problems that arise both on and off the job. Here, too, she will have

a good opportunity to study the emotional status of employees. This is important. It is my opinion that the emotionally upset employee has no more business being on the job than the intoxicated employee. I believe that the nurse has the best opportunity of anyone on the health team to discover those employees who have a tendency to become disturbed and to recognize when they are below par, either as she visits them on her trips through the plant or when they come to her at the dispensary. If she is a good listener, she may be able to advise early treatment for illnesses, to allay fears or to refer the employee to the plant physician or to his family doctor for definitive care. One of the best times to listen, inquire and counsel is on the occasion of an employee's visit to the dispensary for an injury or an illness.

Some inquiry and counsel concerning retirement plans is important. Where retirement at a certain age is mandatory, preparation can be made and the emotional and physical transition planned.

Periodic Health Examinations

Periodic health examinations at intervals of one or more years, or whenever most desirable, are useful tools in checking to see whether treatment has been obtained for remediable conditions noted on the preplacement or a previous physical examination. They are especially useful in the older age groups, where degenerative diseases are most likely to be found. For instance, changes in an employee's mental ability as a result of organic change from arteriosclerosis or other diseases can constitute a serious health hazard, especially where this condition results in unsafe work practices. Also, changes in hearing and in visual acuity frequently occur in later years, with descent to levels that make the worker unsafe.

Hypertension, of course, is a danger not only to the worker but to the safety of those about him. I have seen a good many men who have been injured in falls at floor levels and from high levels whose falls were not due to missteps but to blackouts, unconscious states or paralysis, the result of hypertension and cerebral accidents. Recognition of this condition, with treatment, proper placement or retirement will help prevent such accidents.

The importance of early recognition of coronary disease and other heart conditions which may be the cause of accidents is self evident. Diabetes frequently is found developing relatively late in life. Its proper diagnosis and treatment is of paramount importance to the individual's health and safety.

The greatest contribution of the periodic health examination lies, of course, in health maintenance, for it is in the periodic examination that many disease processes are found early, so that curative or corrective steps can be taken to maintain the health of that individual. The nurse, by follow-up of these cases, increases the probability that the curative or corrective procedures suggested are met.

Where individuals are exposed to special hazards, the periodic examination is mandatory. The industrial nurse who has provided herself with the proper background knows who these men are, what jobs they are on and the hazards of those jobs. She has been watching them without their consciousness of it. She knows how often they are to be examined and what special examinations are necessary. She frequently makes all the arrangements and schedules the examination with the plant physician.

Health Education

Health education is the teaching to workers, singly or in groups, of the value of accepted health practices such as adequate rest, diet, recreation, as well as the advisability of seeking early treatment for disease or illness. Community resources for diagnosis and treatment of special diseases and conditions are pointed out. Participation in screening programs sponsored by special foundations, associations and public health authorities should be encouraged. The nurse solicits the cooperation of voluntary health agencies. The value of certain immunization programs is stressed.

Constructive Medicine

The field of constructive medicine has to do with prevention of progression of diseases and conditions, and the building up of healthful states by follow-up and care of employees with all types of health defects, whether they are the result of their work. If a nondisqualifying defect has been found on preplacement physical examination, it is in this element of the health maintenance program that it should receive attention. The same is true if an amenable defect is found following preplacement or periodic physical examination, or on physical examination prior to promotion, transfer or return to work after illness or accident. Adequate records of these defects must be maintained if their follow-up is to be effective. Maintaining these records frequently is the responsibility of the nurse. The use of rehabilitation procedures properly is a function of constructive medicine. The nurse can suggest the benefits arising from rehabilitation programs and can stimulate those affected to make and keep appointments for their care.

Safety Activities

The individual nurse must coordinate her formal safety and accident prevention program activities with other personnel charged with responsibility for safety. These include safety engineers, industrial hygienists, plant safety committees and private and public health agencies. However, she often is the only one available to indoctrinate new employees into the plant safety program and to point out the importance of their individual participation in it. She stresses the importance of reporting all accidents, no matter how minor they may seem even to the injured man. She points out that certain protective methods and devices are provided, that they must be used where provided, and failure to do so reported immediately. It is interesting that Safety Council studies indicate that a fully successful safety program for eyes alone, including use of safety goggles and eye protection, would reduce the total of all accidents in industry by 7%.

The nurse should participate in the activities of a plant safety committee, or a safety and health committee. There, she is in the best position to explain the type and extent of the injuries being investigated. Because employees know she will keep their confidence, she frequently will have more information about the circumstances surrounding an accident than will the foreman or a safety engineer. In addition, the nurse can help to organize plant safety teams and help in the safety program by preparing news articles, folders, graphs and signs to further safety.

Records and Reports

I have put forward nine important points in the role of the industrial nurse in health maintenance and accident prevention. My final point is a necessary sequel to any of the nine. Comprehensive records must be kept and reports rendered in order that management be informed in their continuing responsibility for health and safety. Reports are necessary to direct and evaluate preventive medical techniques and to chart progress in the reduction of the 80% of accidents in industry that are the result of human failure.

When one reviews the elements and services constituting an ideal health maintenance and accident prevention program in industry and considers the specialized knowledge that must be acquired, one is in a better position to participate in or to prepare to participate in this rapidly growing field of nursing and preventive medicine and to enjoy the rewards that go with building health in industry rather than simply repairing it.

Worker's Disability Payments

The 1958 amendments to the social security law include important changes which affect disabled persons and their families.

One change omits the requirement that a disabled person needs one and one-half years covered work of the three years just before he became disabled. He now needs to have only five years covered work of the last 10 years before he became disabled.

Another important change in the recent amendments provides for the first time social security benefits to the dependents of the disabled worker who is receiving disability benefits. The following dependents now may receive social security payments: (1) Unmarried children under age 18; (2) Disabled children of the disabled worker provided the child's disability began before age 18 and are unmarried when application is filed; (3) A wife age 62 or older; (4) A wife of any age, provided she has in her care a child entitled to social security benefits; (5) A dependent husband age 65.

Role of Government and the Community in

PREVENTIVE MEDICAL SERVICES

• ADMIRAL BEN MOREELL
Chairman of the Board
Jones & Laughlin Steel Corporation
Pittsburgh, Pennsylvania

"Every man is responsible for his own health. In this matter he often needs advice and guidance. Here industry can take the initiative through a preventive health program."

Preventive medicine comprises that group of human actions which has as its goal the averting of disease or, if avoidance is not possible, the amelioration of the more serious consequences. The principal roles in preventive medicine have been pre-empted by industry, by government and by the community. I submit that individuals, too, have an important role to play in preventive medicine, not only with respect to the welfare of their neighbors, but also with respect to their own persons. To pinpoint this aspect, I would like to quote from the Statement on Corporation Policy which was formulated by our Medical Director, Dr. Lauer:

"Health is a personal matter. Man's well-being is dependent in large measure upon good health. Its influence is reflected in his ability to produce, in his relations with others, and his future accomplishments. Industry is directly concerned with the health of its people.

"Every man is responsible for his own health. In this matter he often needs advice and guidance. Here industry can take the initiative through a preventive health program."

Preventive medicine in its relationship to curative medicine might be likened to the art of diplomacy and its relationship to war. No one can say with any degree of accuracy how many incipient wars have been snuffed out by skilled and vigorous diplomacy. In like manner, no one can say how many lives have been saved and debilitating illnesses averted by skilled and vigorous preventive medicine. We do know that in both cases the numbers are significant.

Presented at the Fourth Lake Logan Conference, Lake Logan, North Carolina, May 2, 1958.

We used to say in the Navy that the quickest and most economical way to obtain a battleship for action in the line is to safeguard the one you have, and if it should be damaged by enemy fire, it is usually quicker and less costly to repair it than to build a new one. In the same manner, the quickest and most economical way to obtain a skilled working force is to safeguard the health and well-being of the workers we already have. By doing so we avoid the expense of recruiting, training and indoctrinating the replacements of those with essential experience who are lost through failure to apply known preventive measures.

As Dr. Lauer's statement implies, no individual can delegate to another individual, or to a group, or to government the entire responsibility for his physical well-being. While group action is an essential element of the total preventive medicine effort, this effort, to be completely effective, must be buttressed by individual action with respect to the welfare of others as well as of one's self. It is evident that in a matter of such transcendent importance to the whole of society there are significant and legitimate roles for industry, for government, for the local community and for individuals.

What are the essential elements of an effective preventive medical program? Using the definition of preventive medicine that I have mentioned above, it appears evident that any schedule of action must deal with and coordinate the two essential parts, man and his environment.

It seems to me that the basic elements of such an action program are three in number. (1) Statistical: to collect, tabulate and analyze data

on the mass manifestation of disease in man. (2) Research: to discover the environmental factors responsible for the propagation of disease, and (3) Preventive action: to make suitable changes in man, or in his environment, or in both to interrupt new case production.

The traditional preventive actions applied directly to man are detection, immunization, early treatment and/or isolation, and, most important of all, health education.

The environmental factors which now concern us have to do with the qualities and quantities of food, air, water, shelter and clothing. However, new environmental factors of growing importance such as radioactivity, extremes of noise, light, heat, air pressures and others are now insistently demanding our attention. In addition, there is every indication that mental health has become a subject of vast importance to our society. This development demands that we be concerned with social environment and that we draw upon the behavioral sciences as well as the physical and biological sciences.

Our choices in determining an effective distribution of responsibilities for the total preventive program lie between private industry, whose efforts are activated by short-range or long-range considerations of the profit motive, volunteer individuals or groups, and the political apparatus, local, county, state or Federal, which has, or at least should have, a monopoly of the legalized force. Our question is how much of the responsibility should each assume?

Today there is a dangerous tendency to leave all problems to government. Government has vital functions to perform in the field of preventive medicine, but it cannot do everything.

Perhaps a review of the function of government as it was conceived by those who established our Republic will help us reach a sound conclusion in this matter. There is great danger to our freedoms when individuals or groups attempt to shift their moral responsibilities to the shoulders of the collectivity. Such action usually results in concentration of power in the hands of a bureaucracy. And this power eventually gravitates into the hands of a single person or of a small group. When this happens, we often lose sight of the original objective and then decisions are apt to be based on political considerations designed to maintain power in the hands of those who wield it.

The great British historian, Lord Acton, warned us that, "All power tends to corrupt; absolute power corrupts absolutely." Power, like high explosives, must be dispersed if it is to be handled safely. But conversely we must avoid the atomization of power to such an extent that it is incompetent to discharge its legitimate function. The recognition and avoidance of the danger zone at either extreme requires the exercise of great discernment.

Our political forebears believed that in a free society the power of government is a provisional trust granted by the individual citizens and revocable at will. They held that if the individual is to be encouraged to develop his God-given talents to the fullest degree, the function of government should be limited to that of a mechanism designed to prevent interference with the liberty of the individual by any other individual or by a group, external or internal, or by government itself. The natural rights of the individual to life, liberty and honestly acquired property were to be protected by government against those who would murder, defame, defraud or steal from him. The Constitution of the United States was designed to establish the political mechanism to carry out the principles defined in the Declaration of Independence. These principles were intended to prohibit government from undertaking functions which would transform its character from that of a preventive mechanism to that of an autonomous, creative and productive mechanism. For a government to initiate programs on its own behalf requires that it compel participation on the part of the citizens. So, if men are to enjoy the blessings of liberty they must place restraints on their political agency.

The theory of the Republic was that government has moral sanction to exercise only those powers which the citizens have delegated to it. Since the individual can delegate only that which inherently belongs to him, government has a moral right only to those powers which the individual himself has. For example, the moral code does not permit me to murder, defame, defraud, or steal from my neighbor. Therefore, I am prohibited from delegating to government the power to do these things on my behalf. But the moral code permits me to protect my life, liberty and property against any and all aggression. Therefore, I am permitted to delegate that function to government. The question arises, do I, as an individual, have the moral right to demand that my neighbor eliminate a general hazard to health which he has built near my house, even though it is on his own property? I believe I do. Therefore, I have a similar right to call upon my agent (the government) to do it for me if I cannot induce my neighbor to correct the condition voluntarily.

It is evident that if we wish to avoid the hazards which flow from concentration of power in the hands of government, we should endeavor to have the major and primary responsibility for preventive medicine rest with individuals

or with voluntarily associated groups and try as best we can by education, persuasion and evangelization to keep the responsibility in the hands of private parties.

Realism requires that because of the fallibility of human beings, certain police powers must abide with government, such as requiring certain immunizations, isolations, elimination of general health hazards, old and new, etc. But we should try to keep these government powers to a minimum. I am convinced that as individuals are better educated and inspired, there will be less and less need for the exercise of police power by government with corresponding diminution of the danger referred to by Lord Acton.

At the present time it appears to me that there is a proper area for government action with respect to preventive health activities applied either directly to man or to the environment as the latter may affect him. This area might be tentatively staked out as follows:

(1) Research, both basic and applied: In this case, basic research is designed to develop the theories of causes of disease and methods of prevention and control. Applied research comprises pilot projects designed to test theories developed by basic research.

(2) Demonstration: To arouse public interest by pointing up the practicability and great social values of the prevention and control methods which flow from research.

(3) Action programs: When objectives and methods are understood and public interest is aroused, but voluntary efforts have not yet achieved strength to take over the activity.

(4) Education: Indoctrination of the citizen in his obligation to the social order so as to speed the time when much of the activity can be taken over by individuals and voluntary groups. Parenthetically, we know from experience that, over the long range, important economic advances flow from such activities.

If we concede that the basic environmental activities with which we are here concerned are food and drink, shelter, clothing, and social environment, it becomes clear that significant parts of these activities are beyond the control of government and the responsibility for proper action in those parts is with the individual.

We might take the position that a man can do anything he wishes with his own person until it begins to interfere with someone else, at which time it becomes the responsibility of government to take preventive action. Certainly government can prevent the pollution of the air and of waters, and can insist on such things as the pasteurization of milk. But there is a shadowy line of demarkation between those acts of the individual which affect only his own personal welfare and those which affect the welfare of others. This is what makes it so difficult to define accurately the role of government and the role of the individual or voluntary groups. It seems to me that in the long run the more we can depend upon the individual to do for himself and for others what should be done, the more assured we are of avoiding a regimented society like that of the ants or the bees.

Finally, as an industrialist, I would like to raise some questions which I believe merit our most serious consideration. They have to do with the cost, organization and administration of hospital and medical care programs. American industry, on its own initiative or as a result of collective bargaining, is currently financing a large number of such programs with widely varying characteristics. In assessing the costs, industry customarily expresses them in terms of cents per hour per man. When the amount, so expressed, is added to other employment costs, they show up as of comparatively small importance. However, when the total impact on the income statement in terms of dollars is set forth, the item quickly assumes far greater significance. And when we add up the total costs for all of industry, we begin to see the item in its true perspective. These points are illustrated by Tables I, II and III.

When consideration is given to the amounts now being expended by industry for welfare programs, one wonders why industry appears to have so little concern for the results it obtains from the expenditure of these huge sums.

I know of no other major item in the category of purchased goods and services which received so little critical attention from management. The resultant inefficiency shows up in two ways, in the ineffectiveness of the expenditures now being made, and in the haphazard methods used to determine how much should be spent.

In a speech to the American Public Health Association at their 83rd Annual Meeting in Kansas City in 1955, I made this statement:

"We need an intensive study which will promote a more effective program of so-called fringe benefits. It is no secret that fringe benefits which add up to a substantial cost have been accumulated in a haphazard manner. This is no criticism of labor unions or management. It is a statement of fact. If we could obtain accurate statistical data, we could avoid many disagreements on objectives and methods and provide greatly improved service to our employees, with little increase in cost."

It is certain that more study and research is badly needed in this area. It appears that because of the very nature of the problem, this study and research must be carried on by an impartial

group, perhaps a university or a government agency, but preferably a foundation of recognized competence such as the Health Research Foundation. By this means we could obtain objective data with respect to cost, quality of service, efficiency of administrative methods and the substance of the program.

Several years ago I proposed that we undertake a broad mathematical study to determine how much could be saved in the cost of recruiting, training and indoctrinating new workers needed to replace those lost through neglect if industry should adopt a sound, modern industrial health program which would include periodic comprehensive physical examinations for all employees. In addition to the cost of keeping the organization manned in all ranks, there is another indirect but important cost which results from the loss of production and earnings which occurs when a valuable employee drops out. I had intended to undertake such an analysis myself, having been at one time interested in the study of mathematics, but reorganization problems in my corporation prevented my doing so. The design of a study of this kind would admittedly be most difficult but it is a project crying to be done!

The considerations which I have mentioned are purely economic, having to do with ultimate effects on the profit and loss statement. But there is another consideration of far greater import which has to do with the human factor, with what is happening to the worker himself, to those who are dependent upon him and to his community. The social impact of illness, disability and death is incalculable. I am quite sure that when we finally appraise that impact we will find that it is staggering.

Our American society is based on individualism, but not an undisciplined individualism. The founding fathers held that individual freedom must be exercised within the limitations imposed by the moral code which, as a minimum, I would define as the Ten Commandments and the Sermon on the Mount. If we are to charge individuals with the responsibility for self-discipline, then we must do our utmost to see that they have sufficient education to achieve understanding, after which we should exercise persuasion and evangelization in order that they may grow in wisdom.

TABLE I.
WELFARE AND PENSION PROGRAMS*

Type of Benefit	Number of Persons Covered (1954) (Millions) Employees	Dependents	Total	Employees Covered as Percent of All Employees
Welfare:				
Life insurance and death benefits	29.5	1.1	30.6	55.0%
Accidental death and dismemberment	14.0	—	14.0	—
Temporary disability benefits	23.2	—	23.2	43.6
Hospitalization	31.3	44.3	75.6	59.0
Surgical	28.3	39.0	67.3	53.0
Medical	17.3	21.4	38.7	32.0
Pensions	12.5	—	12.5	23.0

*Source: "Welfare & Pension Plans Investigation," 84th Congress, 2nd Session, Report No. 1734. Committee on Labor & Public Welfare (1956), page 11.

Number of persons covered by industrial welfare and pension programs as of 1954, as reported by the Senate Committee on Labor and Public Welfare through its Subcommittee on Welfare and Pension Funds. The significant figures are those showing 75.6 million persons covered by hospitalization plans, 67.3 million by surgical plans, 38.7 million by medical plans, and 12.5 million by pension plans. The last column indicates the employees covered as a percentage of all employees.

TABLE II.
CONTRIBUTIONS UNDER PRIVATE WELFARE AND PENSION PLANS, 1954*
(Millions of Dollars)

Type of Benefit	Total Contributions	Employer Contributions	Employee Contributions
Welfare Plans:			
Life insurance and death benefits	882.1	525.7	356.4
Accidental death and dismemberment insurance	33.5	20.1	13.4
Temporary disability benefits and sick leave	684.6	464.8	219.8
Health Insurance & Services:			
Hospitalization	1,220.3	391.6	828.7
Surgical & medical	714.7	260.7	454.0
Major medical	18.0	9.0	9.0
Subtotal	3,553.2	1,671.9	1,881.1
Pension Plans	3,293.0	2,886.0	427.0
Total	6,846.2	4,537.9	2,308.3

*Adapted from "Welfare & Pension Plans Investigation," 84th Congress, 2nd Session, Report No. 1734. Committee on Labor & Public Welfare (1956) p. 84.

Contributions under private welfare and pension plans for 1954. It shows that the total contributions for that year were 6.8 billions of dollars, the employer contributions being 4.5 billions, and the employee contributions being 2.3 billions.

TABLE III.
GROUP LIFE INSURANCE

1912	12,000 persons
1920	1 million
1940	8 million
1955	30 million

COVERAGE UNDER COLLECTIVE BARGAINING

1948	3.0 million persons
1950	7.5 million persons
1954	11.0 million persons
1957	14.0 million persons

Growth of the coverage of group life insurance from 12,000 persons in 1912 to 30,000,000 persons in 1955, and the increase in the coverage of welfare and pension programs under collective bargaining agreements from 3,000,000 persons in 1948 to 14,000,000 in 1957.

Mr. Industrial Medicine

EDWARD C. HOLMBLAD, M.D., F.A.C.S., Managing Director of the Industrial Medical Association since November, 1941, has retired from that position. Clark D. Bridges, Assistant Managing Director, has been appointed to succeed him.

Doctor Holmblad's services to industrial medicine and its official organization have been recognized and acclaimed by the historian,[1] the biographer[2] and the recorder of career distinctions.[3] No less have they been recognized and acclaimed by his fellows in the field of his work. The Industrial Medical Association gave him its Meritorious Service Award in 1948, and its highest honor, the Knudsen Award, in 1950. But his most enviable accolade has been the fine harmony of friendliness and respect that prompts the whole wide world of industrial health endeavor to call him "Ed" when he is spoken to, and "Mister Industrial Medicine" when he is spoken about. Ed's interest in the Association began in 1924. The organization at that time had 203 members, an increase of about 50 over the charter enrollment of its first meeting in 1916. Eleven years later, in 1935, there had been a further increase of about the same number, a net gain of 107 in 20 years. Small progress, but actually those decades were a time of seasoning, a training time against the year when the wall of industry's inertia and medicine's indifference would begin to crumble, and the trickle of acceptances would turn to flood. In the light of all that began within its twelvemonth and has continued since, 1935 was that year. Among the events that made it noteworthy was the sudden upswing of the Association's membership curve, in a steady climb from 257 then, to more than 3,300 in 1955.[4] Equally significant was Ed Holmblad's decision that his term as President, which had ended in 1935, was not to be the end of his usefulness. "The official tenure, and the knowledge it gave him, strengthened his interest in the Association's purposes, and enlarged his vision of its opportunity." He wanted to continue in a capacity of service. And so he was elected a Director in 1935, was re-elected twice, and, having completed his third successive term in 1941, was chosen to fill the newly-created office of Managing Director. "This was another of those fortunate comings-together of man and position so characteristic of industrial medicine — another of the workings of what might be thought the 'Destiny' that somehow prepares the two and brings them together at the proper time."[2]

Ed's many active years of guiding the IMA have spanned the period of its greatest and most effective growth. The quality of his guidance is reflected in its advance, as needs appeared and opportunities arose. All this is history, Ed's and the Association's, one and intertwined.

In this Journal, in 1951, it was said; "In his position as Managing Director Ed Holmblad is the career protagonist of all the Association stands for."[2] He was that before he was Managing Director, and he will be that afterward. He can't do otherwise. His idealism needs no umbrella of office; it is part of him. But his concept of "all the Association stands for" is quite different from that of the increasing majority who are putting their emphasis on the so-called scientific. He is a veteran of the pre-1935 cadre for whom the Association's statement of purposes was a code of humanism rather than a frame of reference for the forms and formulas of organization ritual. He is a survivor of the time when the position sought the man to enhance its luster, rather than the man the position to rub off what there was. He is one of the few remaining members of the Order of Abou Ben Adhem, whose instrumentality of contact with his fellow men was love, not psychology. And so he interprets the Association's aims and objects in the wide, warm terms of human qualities rather than the pragmatisms of science.

And now, as he draws away from the Association, he leaves it an organization of meaning and magnitude, with charts, channels, echelons, lines of authority, protocols, sections, boards, committees — all the concomitants of size. Its outlook is toward the rational and scientific. Its pressures are those of the materialism that seem the wave of the future. Ahead of it is conformity to the trends of the times. And thus its aims and purposes will yield increasingly to the letter of convenience rather than the spirit of intent. But Ed remains loyal to the faiths of the early days. He is still the personification of the bond of heart that held the pioneers to their dedicated purpose. It is forever to his credit that, during his capable stewardship throughout the most important quarter-century of industrial medicine, he has nurtured the little flame of the spiritual which, so long as it burns, will save the IMA from becoming just another association.

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Mister Industrial Medicine
Edward C. Holmblad, M.D., F.A.C.S.

Letters

To The Editor:

I would like to offer some comments with respect to the editorial "Legal Condonement of Unintentional Suicide" (January, 1959, issue).

For six and one-half years, I held the position of charge nurse of medical service and safety coordinator with a firm of stevedores and terminal operators in the Port of New York. My function included the composition and compilation of all relevant records, liaison with insurance carriers and physicians as well as with the government agencies concerned with the administration of both state and Federal compensation laws. The foregoing, plus the opportunity to observe the operation of the industry and to hear the philosophy of management and labor as expressed by members of each group, has given me the background which enables me to make the following remarks.

In the stevedoring industry (the stevedore being the contracting employer and the longshoreman the employee hired to do the work) the relation between employer and employee is much different than that which we usually assume to be the case. The longshoreman does not have a steady job with one employer, generally speaking, but is hired by periods of four hours when a ship is to be loaded or discharged at the stevedore's pier. Through custom and practice, which has been sanctioned by contract, specific aggregations of longshoremen ("gangs") have acquired the right of priority for work at particular locations, regardless of any change in the ownership or lessee-ship of the premises. However, since the arrivals and departures of most cargo vessels are subject to a host of variables, the amount of employment at each pier fluctuates erratically in time and volume; the men go where their services are needed when their "own" piers do not require their services. As a result, about thirty thousand longshoremen currently registered in the Port of New York can work for any one of forty-odd contracting stevedores in the port at any time.

This tenuousness of connection between employer and employee makes for a division of interest rather than consideration for each others' rights and welfare. The industry is one of the most hazardous in the United States, according to the yearly statistics of the National Safety Council. The insurance manual rates, effective July 1st, 1957, are $18.00 (New York — stevedoring N.O.C.) and $12.50 (New Jersey — stevedoring N.O.C.). For reasons of general principle as well as the desirability of lessening disability, the best quality of medical care should be available to all who become injured or ill as a fact of their occupations. However, the Longshoremen's and Harbor Workers' Compensation Act does not set up any standards for quality control of medical care (i.e., qualifications of specialists — see 33 U. S. Code annoted 539) as does the Workmen's Compensation Law of the State of New York, where free choice of physician is mandatory (Sec. 13b, subdiv. 2 and "Handbook of Medical Standards Governing Industrial Medicine under Workmen's Compensation Law"). The same Federal law quoted above does allow the deputy commissioner in whose jurisdiction the case takes place to order examination of the injured by another physician if he (the commissioner) believes that the attending physician has not made an impartial evaluation of the disability in question. The New York State law permits the employer to take a hand in the selection of medical care by the claimant by transferring the employee to another physician if 1) it is in the interest of the injured; 2) if the physician is not authorized to care for compensation cases under the law or 3) if the physician is not authorized to treat the particular injury or condition as provided by Sec. 13b, subdiv. 2 (Sec. 13a, subdiv. 3).

Of course it is to the interest of the employer that he provide full and suitable medical care. However, the employer is rarely, if ever, competent to judge professional qualifications. Whether or not the employer's legal agent, the insurance carrier, chooses on a completely objective basis is a matter which can always be open to question. I am happy to say that most of the physicians with whom I made contact for the care of employees under the Federal Act were men of the utmost scrupulousness and fairness in addition to possessing adequate training and experience in their fields.

The comparison made in the last paragraph of the editorial between the demands of the "Longshoremen's Group" and the stand of the United Mine Workers is not, I believe, an exact one. The U.M.W. requested restriction of choice of physician as regards the services rendered in their family welfare program (where quality of service given was the issue in point); the problem being discussed deals with the legal definition of who is to treat diseases and injuries arising out of the occupations of a certain group, which is something else again. I do agree with you that neither attitude is necessarily the correct one. Our social system maintains a dynamic rather than static equilibrium, which allows for constructive change as circumstances warrant.

—MORRIS A. WOLF, R.N., A.M., M.P.H.

Books

Health in Industry

by *Donald Hunter* (Baltimore: Penguin Books, Inc., 1959) $.95

Now the lore of health in industry has reached the pulp and paper-back state of publication. This is not a unique development. Long ago Ramazzini's *De Morbis Artificum* was reduced to a pulp printing and sold in large numbers to tourists in Italy. It was anticipated that this new book might constitute merely a condensation or rewrite of the author's outstanding text *The Diseases of Occupations* in 1957. This is not the case. This pulp book is substantially new except for illustrations.

It has long been the desire of industrial physicians in some manner to reach workers themselves in large number or even to reach the public in large number. That pursuit has not made headway, but this present book promises much in that direction.

One of the handicaps to academic students of occupational health is the high cost of textbooks. The common range is from $12.00 to $30.00. Here, then, is a poor man's textbook in occupational health. Its worth far exceeds the charge made of only 95 cents.

Industrial Toxicology, 2nd ed.

by *Lawrence T. Fairhall* (Baltimore: Williams and Wilkins Co., 1958) $10.00

This second edition of a well established text closely resembles the first in contents, although many refinements and additions may be noted. This reference book is built around no classification of occupational diseases or classification of chemicals except that its two major divisions relate to inorganic compounds and to carbon compounds. The arrangement is alphabetical and uniform. Every item is treated as to physical and chemical characteristics, industrial applications, toxicity, analysis and references. Few items regardless of their importance (benzene, for example) are accorded more than two pages. Altogether this work is closer to industrial hygiene than to clinical medicine. Apart from the introduction this publication makes for drab reading, but in terms of the informative it is superb. This is the sort of reference for which the hope might be that every three years a new edition might appear with all the new developments piled atop the old. That is not a prospect. Unhappily, during the work's preparation the distinguished author and compiler departed on his last journey.

Industrial Medicine In Western Pennsylvania 1850-1950

by *T. L. Hazlett* and *W. W. Hummel* (Pittsburgh: University Pittsburgh Press, 1958) $6.00

So far as known, this is the first regional book on industrial medicine. It is one of a series on the cultural history of Western Pennsylvania, made possible through the generosity of the Buhl Foundation of Pittsburgh. Local pride has led to the contention that Pittsburgh, or more accurately Western Pennsylvania, is the cradle of industrial medicine in this country.

That assertion might be disputed, but the supporting evidence carries conviction. The first part of this publication is an extensive history of occupational medicine in general. This general depiction narrows to Western Pennsylvania and Pittsburgh in particular. Like the early beginnings of industrial medicine everywhere, surgery was outstanding. Western Pennsylvania's early hero in this domain was Dr. Albert G. Walter, who appeared in Pittsburgh about 1837. This surgeon appeared to be dedicated to conservatism in surgery and possibly was the first apostle of prevention in industrial medicine in that area. The surgical phase of industrial medicine dominated industrial medicine until about 1915 and the first world war. Then began the period of preventive medicine, which, strangely enough, the authors brought to a close in 1930. That year, by the authors' timetable, marked the beginning of medical engineering in industry which again came to an end in 1941. Actually preventive medicine and preventive engineering in industry were never more alive than today and hopefully there is no indication of any abatement of activities in that domain. This book is built around names of physicians, engineers and industrialists. Such names appear by the hundreds. All are names of persons who have made notable contributions to occupational health. One appears to be missing, although the search has not been exact. That is the name of Dr. Royd Sayers, long identified with the Bureau of Mines in Pittsburgh, in which work period many of his notable investigations were conducted.

This book, in its own epilogue, well presents its objectives in this language: "The route travelled by industrial medicine in Western Pennsylvania from the days of Albert G. Walter to the present has been long and arduous. It has been a journey from ignorance, uncertainty, and primitiveness to scientific knowledge, understanding, and efficiency in preserving the health of the industrial worker; from the frequently despised company or 'contract' doctor to the highly respected industrial physician;

from primitive first-aid treatment of injuries to highly scientific procedures of preventive engineering; from the uncertainty and inconvenience of court decisions under employer liability laws to the relative security of workmen's compensation supplemented by sickness and accident benefits. It is the story of a steady movement from the simple concept that industrial medicine's sole concern was the treatment of traumatic injuries to the complex idea that anything which may have an adverse effect on the physical and mental health of the industrial worker is the concern of the industrial physician."

An attempt has been made to describe this journey in broad outline. The opening of hospital wards for the railroad and steel workers; the establishment of the first industrial hospital in America at Johnstown; the opening of plant hospitals between 1900 and 1916; the development of preventive medicine and the increased use of pre-employment and periodic physical examinations for employees; the increased cooperation between medical and engineering staffs in industry; the distinguished work performed by industrial medical staffs in keeping the industrial worker at his job during World War II; and the development of good relations between industrial physicians and the private medical practitioner have been described in some detail. Also discussed are the important developments in industrial medical education, mental health in industry, and industrial medical research and literature; and the growth of governmental agencies.

Because of these early developments Western Pennsylvania may be referred to as the "Cradle of Industrial Medicine in America."

Preventive Medicine in World War II, Vol. IV

(Washington, D. C.: U. S. Army, 1958) $5.50

If the thesis be accepted that all military pursuits constitute occupations for those engaged therein, then it follows that many diseases customarily not regarded as occupational become such due to unusual exposures. Typhoid fever, seldom an occupational disease in ordinary life, would become such in soldiers in a camp inadequately protected as to sanitation.

That is not the thesis of this book, originating in the office of the Surgeon General of the Department of the Army. Instead, it is a detailed record of all manner of communicable diseases that arose in army personnel in World War II. In this day when there is belief that most communicable diseases have been banished, it is far from refreshing to discover that practically every known infection appeared in some one or many points of operation including a single fatal case of psitticosis (ornithosis).

The significance of communicable diseases as a threat and facts in military endeavors is well stated in the preface: It is well known from histories of wars that diseases caused by infectious and parasitic agents — the communicable diseases of men and animals — have inflicted great losses upon armies and related groups essential to a military effort. At times, these diseases have impeded campaigns or have contributed to the defeat of armed forces. At other times, they have been milder deterrents. In all instances, however, either as threats or as actual attackers, they have presented large and difficult problems. Military leaders and their medical supporters have always been aware of the handicaps imposed by diseases among troops and of the need to protect troops against disability of sickness, or possibly loss by death, resulting from infectious diseases. These lessons from the past, with almost appalling projections into the imminent future, imparted both urgency and comprehensiveness to the Medical Department's program for the prevention and control of communicable diseases in the Army during World War II. Through its actions in this field, the Medical Department functioned as a part of the administration of the Army.

"The prevention and control of communicable diseases constituted the major segment of the general mission of the Medical Department in securing and maintaining the health of the Army. The understanding of why this was so is readily grasped from apprehending that the segment included a myriad of diseases caused by bacteria, spirochetes, rickettsiae, viruses, fungi, protozoa, helminths, ectoparasites, and toxins, transmitted from man to man and from animals to man by a large variety of means and vectors, under such variations of global epidemiology as made some familiar diseases seem almost as exotic as the newly encountered diseases of foreign lands."

Food for Better Performance

by *R. C. Hutchinson* (Carlton, N. 3, Victoria, Australia: Melbourne University Press, 1958) $2.75

This author from far away Australia, if he could have his way, would provide all diets on a prescription basis in relation to occupations, sports and energy expenditure in any regular fashion. That he knows to be impractical or even impossible. So, sensibly, he writes in generalities about food requirements under varying circumstances of different occupations, energy expending sports, sedentary pursuits and all such. Withal, his pronouncements carry conviction, but the pinpointing involved makes the process exacting. For the individual this book promises much.

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May, 1959

VOLUME XXVIII

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The White Coat Curtain

Medical Care Versus Industrial Medical Program

In some quarters there may be encountered a disposition to label all industrial medical programs as one aspect of medical care. Naturally this attitude did not originate in industrial medicine. The medical services rendered to industrial workers by unions frequently is medical care. Medical care programs often are fostered by industry and costs or parts of costs thereof are paid by industry. All this is apart from the industrial medical program. Only in rare situations is the industrial medical program combined with a medical care program.

Industry and industrial medical personnel lack enthusiasm for the union center type of medical services partly from the fact that such programs are little concerned with the working environment. The best of industrial medical services are performed in the setting of work — on the work premises. Safeguarding of the work environment in the worker's behalf is paramount in industrial medical requirements. Union medical activities for workers and their families are in no position to fulfill this obligation. Foremostly union activities are in truth medical care measures.

The industrial physician's aloofness to medical care measures not always is admirable. For example, the presence of a viral hepatitis in a workman, clearly unrelated to work as to origin, is a matter in which medical care provisions are to be invoked. Manifestly the industrial physician may not accept this patient for care and treatment. Yet it is not sufficient that this situation be handled merely as a statistical item in the records of the insurance or personnel division. In this instance the employee is an absentee; his machine may be idle; production may be hampered. The interests of the employer are as badly served as in the case of a broken bone caused by work. The industrial physician's full aloofness in all such medical care matters do not utilize his best opportunities. Without invading the rightful domain of the family physician, the industrial physician should accept some degree of responsibility, or at least concern, for any and all health affronts to the workers in his establishment.

Steadfastly industrial medicine has declined to extend its services to the worker's family and other dependents or even to the worker himself beyond the medical states of work origin. An

exception to this practice is found in emergency matters, in the care of trivial complaints and in counseling on any health matter to the worker about himself or any member of his family. The practice always is to call upon the worker to "Seek out your family physician" in all major medical situations unrelated to work causation. To do otherwise would incur added wrath from the general medical profession. Notwithstanding proscription of certain activities, The American Medical Association in its *News* (December 1, 1958) under the subcaption "Cause of Friction," notes that in a survey of 244 industrial concerns with 1,440,000 employees, 86 were found to provide partial medical care services beyond first aid, and 24 others extended comprehensive medical care. This source of resentment on the part of general practice likewise is disturbing to industrial medicine as provided at high levels.

Much in the industrial medical programs represents legal requirements imposed by law upon industry in the protection of its workers. These requirements neither may be ignored nor delegated to any agency such as a medical care facility. Shortsighted industry in its bargaining with labor may be importuned or bludgeoned into extending industrial medical services to all the worker's family. Any such step would not constitute industrial medicine. Any such measure would not have the support of industrial physicians and would stir the ire of the general medical practitioners as constituting clear invasion of their territory of professional services. Were that to take place industrial medicine indeed would become medical care.

At once a vexatious paradox arises. The last thing that either the industrial physician or the private practitioner should want is any stiffly starched "white coat curtain" making a dichotomy of industrial medical programs and medical care programs. Perforce, the industrial physician must be concerned with every aspect of the health of every worker primarily in behalf of the worker himself and in behalf of the employer who seeks workers unhampered by any health impairments. This means that the concern, if not the ministrations, of the industrial physician should reach not only the worker but his family and the entire community.

The other portion of the paradox is that pure industrial medicine, but not necessarily occupational health, must be confined to those conditions and the prevention of those conditions of work origin. By and large the environmental preventive programs for work places have proved so successful that the cases of occupational diseases and injuries increasingly are on the wane. Preventive programs unceasingly must be kept in force and must be augmented, yet in a measure the worker's environment already is under control.

The devastation of ill health to industry springs not so much from what the worker acquires at work as from what he brings to work. The prime function of the industrial physician is to serve the worker as the individual and the group in the procurement and perpetuation of total health. That attainment will make possible the industrial physician's delivery to industry of a work force unhampered by the ravages of ill health in all its possible ramifications. Yet as a mighty barrier to that pursuit stands that unwanted "white coat curtain."

The issues now become clearer. Clarification centers about the industrial physician's "ministrations" versus his "obligations." His industrial medical program is not a medical care program nor is a medical care program involving workers an industrial medical program. As to "ministrations" the industrial physician's field of activities is circumscribed and well demarcated — the work environment and workers in that environment. "Obligations" is a much larger and less restricted matter. Since the present day concern for the health of his workers and workers in general is the ill health brought into the work place, then the industrial physician's obligations, influence, participation, contributions and cooperation must reach unfailingly into every factor related to that ill health, its origin and its elimination. This means endless and changing reaches directly and indirectly into the family, the community and the total medical profession. The industrial physician, in his enlarged world of endeavor, becomes a part of every health procurement, conservation and perpetuation measure. He may not ignore or scorn medical care programs as unworthily apart from industrial health. In his "obligations" he will do well to know much about medical care programs, particularly the ones in his plants, to foster the good ones and oppose intelligently the undesirable ones, to counsel workers, to advise industry, to sit on boards and committees. All this should be undertaken not as a part of the industrial medical program but in behalf of workers and management. The industrial physician should be the best informed person on medical care programs in his industry.

If industrial medicine becomes blinded by any "white coat curtain" and fails to see and grasp its wider beckoning obligations, then it will be threatened with the prospect of a circumscribed and sterile future. Then indeed it might be engulfed by some such threat as medical care programs. In that case it would deserve just that fate.

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A similar regimen is employed if the patient is seen during the intermenstrual interval. Even though no bleeding is present a dosage of one or two tablets daily is administered until day 25. Therapy is resumed from day 5 to day 25 for two or three successive cycles.

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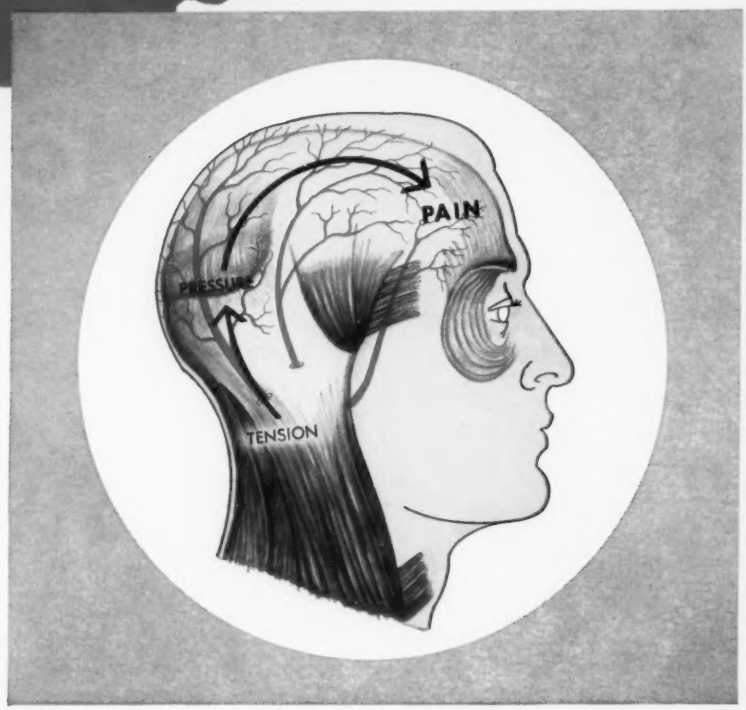

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COMMENT AND OPINION

Don't Tote Dat Bale

West Virginia legislators are considering a bill in this session calling for the prohibiting of regular and repeated lifting of more than 25 pounds by a working female.

House Bill No. 302 was introduced Feb. 6 and referred to the Committee on Labor and Industry. A short bill, it calls for the amending of the state code to read:

"Section 11-a; Lifting Heavy Objects by Female Employee Prohibited. — No female employee in any factory, mercantile establishment, mill or workshop in this state shall be required or permitted to regularly or repeatedly lift objects weighing in excess of twenty-five pounds."

The bill came about after complaints from female garment workers that they were required repeatedly to lift heavy objects daily in connection with their work.

It specifically is designed to help not only the garment workers, but also female workers at glass and pottery plants. All of these are subject to carrying heavy loads often.

Unlike the office worker or housewife, these girls can't sit down and rest a minute when their backs start hurting.

Very little, if any opposition to the weight-lifting bill is expected.

—*Charleston* (W. Va.) *Mail*
February 14, 1959

Cities Not Too Noisy

Noise in big city streets won't hurt your hearing.

"It's a nuisance," says Lemuel C. McGee, M.D., of Wilmington, Del., "but the idea that noise from trolley cars, trucks and air hammers will affect your hearing is a lot of red herring."

"The decibel value and frequency range are too low," Dr. McGee continued. "We figure 90 to 110 decibels of noise will affect hearing. The noise in big cities generally averages a harmless 50 to 60 decibels."

Just about the only noise that will seriously affect your ears is the high-frequency kind made by metal rubbing on metal, Dr. McGee told physicians at the Congress on Industrial Health meeting in Cincinnati, Ohio, February 17.

—*Cincinnati* (Ohio) *Post*
February 17, 1959

Industrial Physicians Needed at Home

Physicians need training in industrial health not only to help employees in plants, but to help the housewife, who is surrounded by mechanical gadgets and dangerous chemicals, according to doctors at the Congress of Industrial Health meeting.

"Doctors must be aware of mechanical accidents, which hap-

Nurse just tears this new
foil suture packet open
to give you stronger,
more pliable surgical gut.
It's sterilized by electron beam.

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pen in the home, particularly poisoning with new types of industrial chemicals used in insecticides, cleaning fluid and the like," Robert A. Kehoe, M.D., Director of the Department of Preventive Medicine at Cincinnati's Kettering Laboratory, reported.

The need for industrial physicians is increasing along with the increased industrialization of the country, James H. Sterner, M.D., Medical Director of Eastman Kodak Co., Rochester, N. Y., said.

"Accident rates in small (under 500 employees) plants are 2½ times the rate of accidents in large plants," Dr. Sterner said. "That is because most small plants do not have full or even part-time physicians on their staffs."

— *Cincinnati* (Ohio) *Post*
February 16, 1959

Color Far Reaching

Color can be profitable in the factory and farm as well as in the home and office. Intelligent use of color on factory machines, for example, brings such positive results for both employer and employees as better morale, greater safety, more efficiency, less waste, reduction of nervous tension and eye strain, better workmanship, high output, less absenteeism, fewer accidents and better labor-management relationships.

—*Lockport* (N.Y.) *Union Sun Journal*, January 30, 1959.

Standards for Radiation Safety

Federal standards for radiation safety and workmen's compensation are demanded by Elwood D. Swisher, vice-president of the Oil, Chemical and Atomic Workers Union. Citing imperative need, Swisher proposes a single Federal health agency to issue and enforce uniform safety standards. Swisher asserts a worker can unknowingly sustain radiation injury in one state, move to another state and be completely unprotected because of the difference in workmen's compensation laws.

—*Industrial Relations News*
April 4, 1959

Chaplains of Industry

Many efforts to assign chaplains in industrial plants fail, report union leaders. Experiments fail in some cases because company-paid chaplains are suspected of boosting management policies through appeals to piety. In one extreme case, a chaplain led workers in prayer against "union oppression." Few chaplains are sponsored by unions, and joint union-management sponsorship is still rarer.

French and British attempts to establish chaplaincies have also failed. According to a recent issue of *Christian Century*, chaplains abroad have erred in trying to persuade workers to serve the church instead of bringing the church into service of the "particularly troubled and needy part of the human community."

—*Industrial Relations News*
April 4, 1959

Private Nurse, New Fringe

New fringe benefit for workers at the Goodyear Tire &

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The 613-R, with greater capacity, accommodates three large trays (6" x 13"). Handsome, all stainless steel construction is durable and easy to clean. Other features include a Safety-Lock Door, Adjustable Thermostat and Accurate Temperature Gauge. Automatically burn-out proof.

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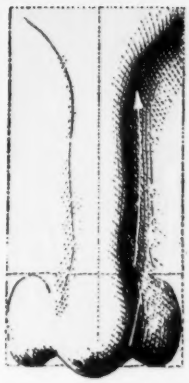

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Rubber Co. in Akron, Ohio, is private nursing care. The Company agrees to pay 50% of the cost of nursing care for 240 hours at the area's prevailing rate, if this care is ordered by the attending physician. Only graduate, registered nurses may be used. —*Industrial Relations News*, March 28, 1959.

Cardiacs Can Work

Cardiacs on payroll don't affect workmen's compensation insurance rates, claims American Heart Association. "Experience shows," AHA reports, "insurance rates are not increased when the worker's heart condition is known so that he can be placed in a suitable job." The AHA, fighting employer reluctance to hire heart victims, sponsored The Heart in Industry conference in New York. Theme of conference: Heart victim is productive, largely untapped source of manpower. A 50-industry study shows cardiac productivity 2% higher than unimpaired workers doing same job. Follow-up studies of cardiacs indicate 75% recovering from attacks are re-employable. One AHA survey found 25% could work full time without any limitation.

What kind of work for heart victim? Philadelphia study of 40,000 heart workers indicates one-fourth of all industrial jobs are performable by heart victims without compromising job or worker. Key to job placement: Worker's energy potential. Ordinary jobs require two to four times energy output of resting state. Most heart victims can safely expend that amount at work. AHA maintains clinics to examine victims, determine energy limits, assist in placement. Cardiacs placed by top companies, including Westinghouse Electric, Yale & Towne, Gulf Oil, Electric Storage Battery, RCA, and Campbell Soup. Aim: Preserve skills of experienced workers.

One pioneer, Sperry Rand Corp., Great Neck, N.Y., employs over 400 heart victims among 1,200 disabled carried on payroll. Sperry's philosophy: Physically or medically disabled worker not necessarily vocationally handicapped. Payoff: 7.8% of all Sperry workers medically handicapped, yet profitable manpower source to company.

Is exertion taboo for heart victim? No, says AHA, if moderate and within worker's energy potential. In fact, some exercise should be included in recovery program, if not during working hours, then afterward. Underexertion may be more serious concern, leading to physical and psychological fatigue. As automation cuts job energy requirements, this problem grows. Statistics indicate higher recovery rate among cardiacs holding jobs requiring some exertion than those with sedentary jobs. British scientific team suggests heart illness may be disease of "easy" job. Returning cardiac to completely sedentary job may prove fatal.

Worker attitude toward work main factor in readjustment and recovery. Some 50% of cardiacs fear return to job. Others, anxious to resume, tend to minimize job demands. Metropolitan Life Insurance Co. finds many cardiacs still working at full capacity

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For company operated medical facilities in Saudi Arabia

Preferably Board-certified or Board-eligible in preventive medicine (occupational medicine). To develop industrial medical service as part of company's general medical program. Liberal benefit program; modern family housing; plus educational and recreational facilities available. Write outlining personal and professional history.

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Index of Advertisers

American Sterilizer Co. . . 36
Arabian American Oil Co. 38
Armour Pharmaceutical Co. 7, 17, 19
Arnar-Stone Laboratories 20
Bristol-Myers Co. 45
Bullard Co., E. D. 46
Cambridge Instrument Co. 43
Carbisulphoil Co. 46
Chesebrough-Pond's, Inc. 14
Desitin Chemical Co. 27
Doho Chemical Corp. . . . 29
Dome Chemical Co., Inc. 41
Eaton Laboratories 24
Ethicon, Inc. 35
Fleet Co., C. B. 13
Johnson & Johnson 25
Lilly & Co., Eli 32
McNeil Laboratories, Inc. 1, 47
Merck Sharp & Dohme . . . . . 3rd cover
National Dairy Council . . 12
Picker X-Ray Corp. 2
Reed & Carnrick 43
Riker Laboratories, Inc. . . . . 2nd cover
Robins Co., Inc., A. H. 5, 26
Roerig & Co., J. B. 31
Sanborn Co. 11
Schering Corp. 15
Searle & Co., G. D. 33
Shield Laboratories 40
Smith, Kline & French Laboratories 30, 48
Squibb & Sons, E. R. 9, 22, 44
Syntex Chemical Co., Inc. 18
Wallace Laboratories 21, 4th cover
Warner-Chilcott Laboratories 16, 37
White Laboratories 39
Whitehall Laboratories 34, 42
Winthrop Laboratories . . 28
Woodward Medical Personnel Bureau 46
Wyeth Laboratories, Inc. 23

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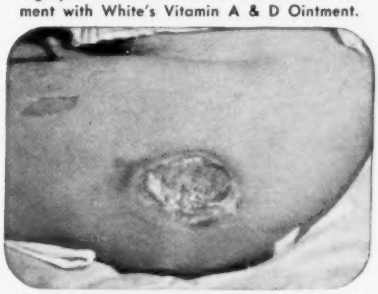
Before applications of White's Vitamin A & D Ointment—Severe pressure sore in area over greater tuberosity of femur.



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Supplied in 1½ and 4 oz. tubes; 1 lb. jars and 5 lb. containers.

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10 years after attack. Best practice in keeping cardiac on the job: Once he recovers from heart attack, he can do anything in moderation, usually can return to work on "business as usual" basis. —*Industrial Relations News* January 31, 1959.

Cancer Linked to Mine Gas

Many Colorado uranium miners are inhaling radioactive gases that can cause lung cancer, a Colorado Health Department official has announced.

P. W. Jacoe, M.D., Chief of the occupational health section, said one Western Slope miner already has died from lung cancer that may have been caused by breathing the radioactive gases found in uranium mines. He estimated more than 2,000 other Colorado uranium miners are jeopardized by the gases in improperly ventilated uranium mines.

"The situation is quite serious and we're asking the Legislature for a one-year emergency program to investigate conditions in the 400-odd Colorado uranium mines."

A $22,000 appropriation sought by Dr. Jacoe's department would permit inspection and surveying of ventilation in the state's uranium mines. He endorsed a report by U. S. Public Health officials that proper ventilation of mines can substantially reduce the dangers of inhaling the radioactive gases coming from the disintegration of radon gas. (Radon gas breaks down into radium A, radium B, radium C and radium C-prime.)

—*Denver* (Col.) *Post* March 17, 1959.

How's That Again?

Pre-employment hearing tests may reduce employer liability for hearing loss suffered by workers on the job. A New York State compensation law, passed in 1958, permits reduced employer liability on the basis of pre-employment hearing examinations. This legislation, watched closely by other states, has not yet been fully tested.

The program adopted by one New York plant has been hailed as a model. The plant's insurance carrier obtains recommended hearing examination procedure from hearing experts. A local hearing specialist picks out a hearing test device (audiometer) for use. Insurance carrier tests plant locations for the noise level. The plant nurse is trained to use the audiometer. Equipment cost: $1,541. This amount is roughly 23% of a single award for total hearing loss at weekly benefit rate of $45.

Two sources of industry resistance to hearing programs: The cost, and fear examinations will lead to a rash of hearing-loss claims. Few claims actually occur and advantages of the program outweigh the costs. In addition to lowering compensation costs, preplacement audio examinations enable the company to avoid locating workers with impaired hearing in spots where noise level could further injure them, and prevent injury to workers with good hearing.

—*Industrial Relations News* March 28, 1959.

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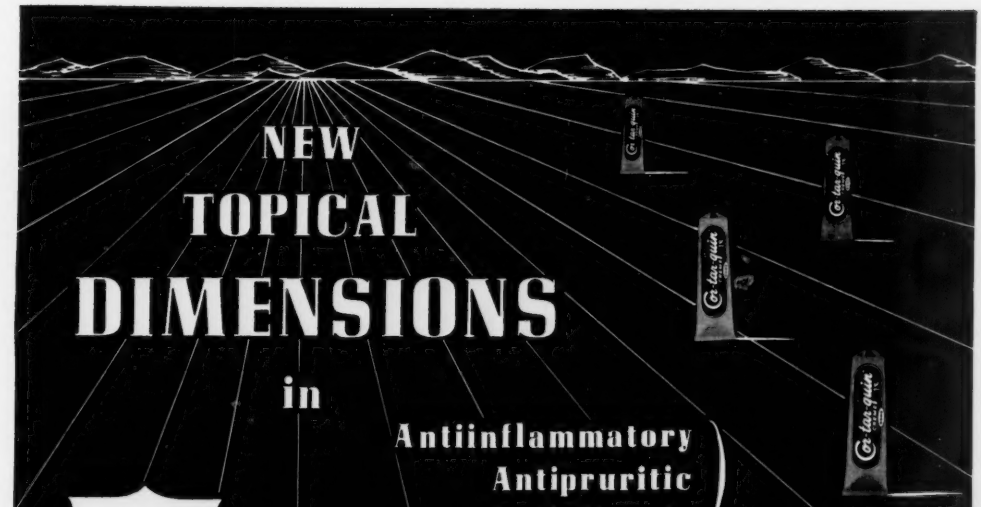

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—Rein, C. R., and Fleischmajer, R.: Personal Communication.

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References: Annals of Allergy, Vol. 6. July-August 1948. Study of a New Histamine Antagonist, The Pennsylvania Med. J., Vol. 51. Clinical Study of a New Antihistaminic Drug—Phenindamine. Dristan Clinical Study.

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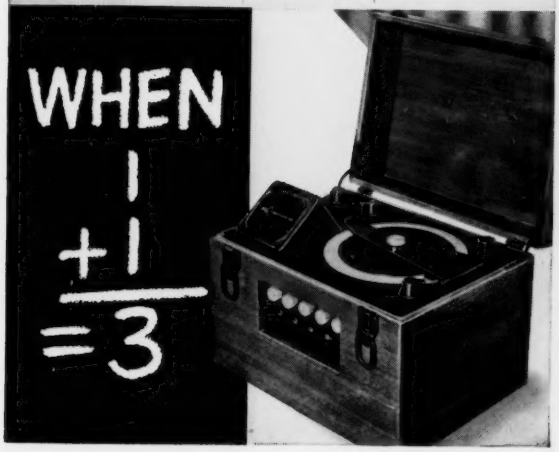

Mathematically, of course, 1 plus 1 does not equal three, but the Cambridge Audio-Visual Heart Sound Recorder makes a seeming paradox — true! The simultaneous, instantaneous viewing and hearing of the heart sounds give more than the simple sum of the two . . . they provide the plus factor!

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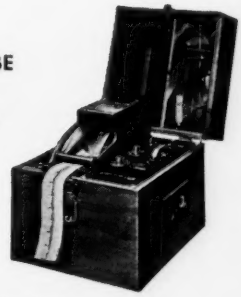

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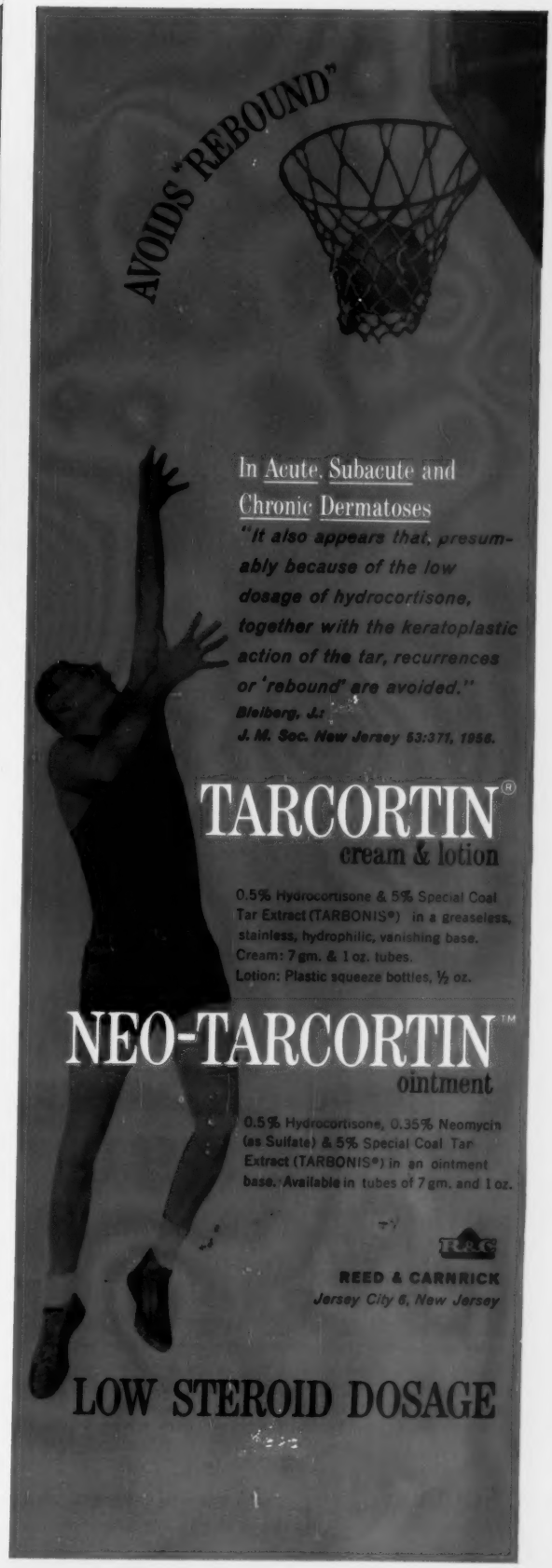
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Bleiberg, J.:
J. M. Soc. New Jersey 53:371, 1956.
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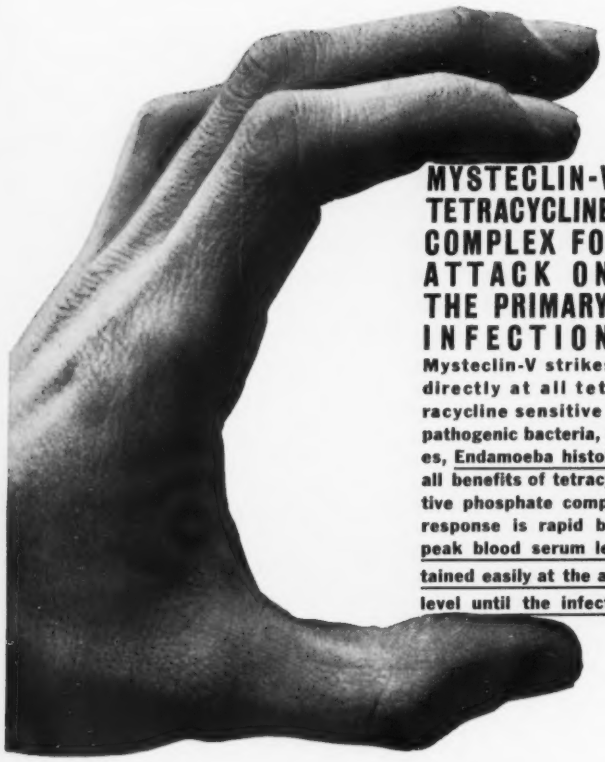

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References: 1. Cronk, G. A.; Naumann, D. E., and Casson, K.: Antibiotics Annual 1957-1958, New York, Medical Encyclopedia Inc. 1958, p. 397 • 2. Newcomer, V. D.; Wright, E. T., and Sternberg, T. H.: Antibiotics Annual 1954-1955, New York, Medical Encyclopedia Inc., 1955, p. 686.

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Reference: 1. J.A.M.A. 158:386 (June 4) 1955.

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It relieves the depression, the cramps, the pain.

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Formula: Each 'Edrisal' tablet contains: 'Benzedrine' Sulfate (brand of amphetamine sulfate), 2.5 mg.; aspirin, 2.5 gr.; phenacetin, 2.5 gr.

EDRISAL®

ANALGESIC • ANTISPASMODIC • ANTIDEPRESSANT

two tablets every 3 hours

Smith Kline & French Laboratories, Philadelphia

no irritating steroid particles
The solubility of prednisolone acetate in water is 0.01 mg./cc. Suspended particles as shown are irritating to eye.
*The solubility of HYDELTRASOL—prednisolone 21-phosphate as the monosodium salt—is 675 mg./cc. or over 2000 times more soluble than prednisolone or hydrocortisone.

STERILE OPHTHALMIC SOLUTION

NEO-HYDELTRASOL®

(prednisolone 21-phosphate with neomycin sulfate)

2000 times more soluble than prednisolone or hydrocortisone*

- free of any particulate matter capable of injuring ocular tissues.
- uniformly higher effective levels of prednisolone.

SUPPLIED: Sterile Ophthalmic Solution NEO-HYDELTRASOL 0.5% (with neomycin sulfate) and Sterile Ophthalmic Solution HYDELTRASOL 0.5%. In 5 cc. and 2.5 cc. dropper vials. Also available as Ophthalmic Ointment NEO-HYDELTRASOL 0.25% (with neomycin sulfate) and Ophthalmic Ointment HYDELTRASOL 0.25%. In 3.5 Gm. tubes.

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FOR RELIEF OF ANXIETY
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Selective

Does not interfere with autonomic function
Does not impair mental efficiency,
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Has not produced hypotension,
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WALLACE LABORATORIES, New Brunswick, N. J.

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